STATE OF MISSOURI
Bob Holden, Governor • Stephen M. Mahfood, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.state.mo.us

JAN 0 2 2003

Dear Sir/Madam:

Enclosed is your 2002 Emissions Inventory Questionnaire (EIQ) packet. The information you supply through the questionnaire helps our office track air quality throughout the state. Included in your packet is a salmon-colored sheet; it outlines recent changes to the EIQ forms and instructions and includes information essential to the EIQ reporting process. Please review this sheet carefully.

Completion of this questionnaire and payment of an annual emissions fee is required by revised rule 10 CSR 10-6.110 "Submission of Emission Data, Emission Fees, and Process Information." The fee is based on $31.00 per ton of air pollutants emitted from your facility during the 2002 calendar year. Failure to submit a completed questionnaire or to pay the emissions fee is a violation of state law and may subject you to penalties. If your facility did not operate in 2002, please send the Air Pollution Control Program a letter stating that fact. If you operated for only a portion of the year, provide the information for that time period you operated.

Please complete and return the EIQ and the emissions fee to our office before April 1, 2003. In addition to the required emissions data and fee, the submission is not considered complete unless it is signed by an authorized company representative.

We have developed a new emissions inventory system (MoEIS) that allows companies the option of submitting their EIQ online. Please see the insert titled "ONLINE EIQ SUBMITTAL INFORMATION" for further information.

If you need assistance, please contact the Air Pollution Control Program's Technical Support Section at P.O. Box 176, Jefferson City, MO 65102 or by phone at (573) 751-4817 or call the Environmental Assistance Office at (800) 361-4827.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Leanne J. Tippett
Interim Director

LJT:chb

Enclosures

Integrity and excellence in all we do

IMPORTANT INFORMATION
2002 EMISSIONS INVENTORY QUESTIONNAIRE (EIQ)

- **FEE INCREASE:** The emission fee has been raised from $25.70 per ton of emissions to $31.00 per ton. Please take note of this in your fee calculations on Form 3.0.

- **ELECTRONIC SUBMITTALS:** In past years, facilities have been offered the opportunity to submit their EIQ via the EIDES system. With the new Missouri Emission Inventory System (MoEIS) having gone online, we now allow electronic submittals only through MoEIS; submittals via EIDES will not be accepted. Go to https:\\www.dnr.state.mo.us\prod\moeis\main\login for the MoEIS web application.

- **HAZARDOUS AIR POLLUTANT REPORTING:** Form 2.T has been changed in order for companies to be able to report controlled HAP emissions by individual HAP, if different control efficiencies are valid. If different HAP control efficiencies are being reported, they must be specified on Form 2.0C. Please review the HAP list to determine if reporting HAPs is required and if a Form 2.T Hazardous Air Pollutant Worksheet needs to be completed.

- **MAXIMUM HOURLY DESIGN RATES (MHDR):** Please complete this field on Form 2.0. The MHDR may be found through the manufacturer's information on the emission unit, permit limitations, engineering estimates based on the emission unit working at full capacity, or other means.

- **ADDITIONS TO EXEMPT VOC LIST:** If reporting VOCs, please review this list.

- **STACKS:** When entering stack information, complete all the stack parameters, not just height and diameter. Flow rates can be obtained from manufacturer's fan output information in some cases (rated flow rate on the equipment). If a stack exit velocity is known through a test, then the stack cross-sectional area can be multiplied by the velocity to get the flow rate.

- **COMBUSTION UNITS:** A Form 2.1 Fuel Combustion Worksheet must be completed for all combustion units, including generators, if calculations of the maximum hourly design rate are not documented elsewhere.

- **PRE-PRINTED FORMS:** Pre-printed information is helpful for most companies and can sometimes be essential in accurately reporting your data. For your convenience, we may have included a pre-printed Form 1.0 and 2.0 for your facility. Review and verify the data and make all necessary changes.

- **ADDING/DELETING POINTS:** RENUMBERING POINTS IS UNACCEPTABLE for any reason, whether they are existing, new, or you are deleting points. A new point must be given a unique number not previously used. A point may be deleted only if the process equipment has been dismantled. If the process was inoperative during the year, report as before except enter a throughput of zero. If the emissions were below the reporting threshold, just enter the annual throughput.

- **BEFORE RETURNING THE EIQ,** please review each item on the enclosed checklist.

ONLINE EIQ SUBMITTAL INFORMATION

The Missouri Air Pollution Control Program is pleased to announce that companies will be able to submit their 2002 Emission Inventory Questionnaire (EIQ) online, if they so choose. The Environmental Assistance Office will send out an announcement within approximately the next week listing an initial schedule of industry workshops. At these workshops, a CD will be distributed that gives further training on MOEIS. To obtain a copy of the CD, call the Technical Support Section toll-free at (866)663-4748 (or 866-MOEIS4U) to request one. We recommend, however, that a company attend one of the workshops before beginning data entry online.

We hope the Missouri Emissions Inventory System, or MoEIS, will save the regulated community time and resources in completing its annual reporting requirement. To assist industry, we will also offer a toll-free help line to answer questions related to completing the EIQ online. You may call the toll-free number if you have questions once you get started.

In addition, the Emission Inventory Questionnaire (EIQ) forms, worksheets and instructions are available on the Air Pollution Control Program's web page:

www.dnr.state.mo.us/deq/apcp

Click on **EIQ Forms in PDF.**

REMINDER

Operating Permit Reports

Sources that have applied for or have been issued Basic Operating Permits including dry cleaners must submit an Annual Compliance Certification by April 1st to certify compliance for the previous calendar year.

Sources that have applied for or have been issued Intermediate Operating Permits must submit an Annual Compliance Certification by April 1st to certify compliance for the previous calendar year.

Sources that have been issued Part 70 Operating Permits must submit Semi-annual Monitoring reports by October 1st to certify compliance for the first six months of the current year. They must submit a Semi-annual Monitoring report by April 1st to certify compliance for the last six months of the previous calendar year. They must submit an Annual Compliance Certification by April 1st to certify compliance for the previous calendar year.

New forms are available on the Internet at
http://www.dnr.state.mo.us/oac/forms/index.html#Air%20Pollution

FORM 1.1 PROCESS FLOW DIAGRAM

Facility Name	FIPS County No.	Plant No.	Year of Data

Please use this page or a separate sheet to provide a Process Flow Diagram per the instructions for Form 1.1 in the Instruction Packet. Do not forget to include all processes used in your facility. Make sure to label each process and piece of equipment and provide an identification number for all emission points (including fugitive emissions) and air pollution control equipment. Make sure to use the same identification number throughout the entire EIQ.

Duplicate this form as needed.

FORM 1.2 SUMMARY OF EMISSION POINTS

Facility Name	FIPS County No.	Plant No.	Year of Data

[1] Total Number of Emission Points	

[2] Point No.	[3] Point Description (Use same description on Form 2.0)	[4] Worksheet(s) Used with Form 2.0

Duplicate this form as needed.

FORM 2.0 EMISSION POINT INFORMATION

Facility Name	County FIPS No.	Plant No.	Year of Data

[1] POINT IDENTIFICATION

Point No.	AIRS ID - Pt	SIC Code	Point Description

Source Classification Code (SCC)	Emission Factor Units	Number of SCCs Used with this Point	Seq. No.

SCC Description

[2] STACK/VENT PARAMETERS

Stack No.	AIRS ID - St	Height (Ft)	Diameter (Ft)	For a non-circular stack: Diameter = (1.128A)^1/2 (A = Cross Sectional Area in sq. feet)

Temperature (F)	Velocity (Ft/Min)	Flow Rate (Cu Ft/Min)	List other points sharing this stack.

[3] AIR POLLUTION CONTROLS

Device No.	Device Code	Description of Control Device	Capture Efficiency (%)	Control Device Efficiency (%) PM10	SOx	NOx	VOC	CO	Lead	HAPs

[4] OPERATING RATE/SCHEDULE

Annual Throughput	Units	Hours/Day	Jan-Mar (%)	Apr-Jun (%)
		Days/Week		
Maximum Hourly Design Rate	Units\Hr		Jul-Sep (%)	Oct-Dec (%)
		Weeks/Year		

EMISSIONS CALCULATIONS

Source of Emission Factor : (List below in [6])

1 CEM
2 Stack Test
3 Mass Balance
4 AP-42 or FIRE
5 Other
6 Eng Calc
Worksheet Number (Please identify worksheet)

AP 42\Other Reference

[5] List other worksheets.

Air Pollutant	[6] Source	[7] Emission Factor (Lbs/Unit)	[8] Ash or Sulfur (%)	[9] Overall Control Efficiency (%)	[10] Actual Emissions (Tons/Yr)	Maximum Hourly (Lbs/Hr)	Potential Controlled (Tons/Yr)	Potential Uncontrolled (Tons/Yr)
PM10								
SOx								
NOx								
VOC								
CO								
Lead								
HAPs								

Duplicate this form as needed.

STATE OF MISSOURI
Department of Natural Resources
Air Pollution Control Program
205 Jefferson Street, P.O. Box 176
Jefferson City, Missouri 65102

FORM 3.0 EMISSIONS FEE CALCULATION

Facility Name	FIPS County No.	Plant No.	Year of Data

[1] POINT No. / SCC

(Use one row to list the emissions from one emission point. Sum the emissions in the page total box at the bottom of the column. If more than one page is needed, use the first row of the duplicated page to list the page totals from this page. Express emission figures in tons per year and round to two [2] decimal places.)

	Air Pollutant							
	PM10	SOx	NOx	VOC	CO	LEAD	HAPs	
PAGE TOTALS								

NOTE: FILL OUT THE LOWER PORTION OF THIS FORM ONE TIME ONLY.

[2] ACTUAL EMISSIONS (Make sure to use the sum of ALL page totals for each pollutant for the actual emission figures below.)

Please report emissions to two decimal places.	PM10	SOx	NOx	VOC	CO	LEAD	HAPs	

Copy the Actual Emissions from [2] to the appropriate box(s) in the Total Plant Emissions section of Form 1.0.

[3] CHARGEABLE EMISSIONS (Maximum 4,000 Tons/Yr Cap per Pollutant)

					NO FEES FOR CO			

[4] SUM OF CHARGEABLE EMISSIONS SUBJECT TO FEES (Maximum 12,000 tons per year cap.)

Round figure to nearest ton per year. _____ Tons/Yr

[5] TOTAL ANNUAL EMISSIONS FEE

($31.00 PER TON OF POLLUTANT LISTED IN Box 4) Minimum value is 1 ton

$ _____

[6] Include a check for the amount in Box 5, payable to the Missouri Air Pollution Control Program. Mail the check for the emissions fee to the state air agency listed at the top of this form.

Facilities within Local Air Program jurisdiction only need to include copies of Forms 1.0, 3.0 and 4.0 along with the emissions fee check.

[7] Send the completed questionnaire and any supporting documention to the agency listed at the top of Form 1.0.

Duplicate this form as needed.

FORM 4.0 FINANCIAL COST ESTIMATE

Facility Name	FIPS County No.	Plant No.	Year of Data

The Missouri Air Law, Chapter 643 requires a financial cost estimate. The cost estimate is an evaluation of any additonal costs of doing business attributable to the federal Clean Air Act, as amended.

Please calculate the cost and expenses incurred to complete the Emission Inventory Questionnaire (EIQ), including the calculation of emission fees. If you hired an outside consultant, please include the time and money charged to your company. Also include any cost incurred if you installed air pollution control equipment, any additional monitoring or testing expense or any additional personnel costs incurred to comply with the Missouri Air Law and the federal Clean Air Act, as amended.

PLEASE BE SURE TO USE THE CODES. SEE INSTRUCTIONS FOR LISTS.

Category Reporting	CODE for Personnel or Equipment	Total Number of Hours Required	Cost per Hour	Total Cost
[1] EIQ reviewed and completed by Company Personnel (Engineers, Technical Specialists, Others)				
[2] EIQ completed by outside Engineering Consultants				
[3] Pollution control equipment, monitoring, or testing (Please list items separately)				
[4] Estimate of the number of jobs added to implement the federal Clean Air Act, as amended				
[5] Personnel and other costs associated with complying with the Clean Air Act, as amended, which have not been included above (Please list items separately)				
TOTAL				

Remarks

STATE OF MISSOURI
Department of Natural Resources
Air Pollution Control Program
205 Jefferson Street, P.O. Box 176
Jefferson City, Missouri 65102

Emissions Inventory Questionnaire (EIQ)

FORM 1.0 GENERAL PLANT INFORMATION

Shaded Areas for Office Use Only

Facility Name		FIPS	Plant No.	County No.	Year of Data 2002
Facility Street Address		County Name	Region	Classification / Permits
City	ZIP Code	Facility Phone Number		
Facility Mailing Address		Product/Principal Activity		
City	ZIP Code	Number of Employees	Land in Acres	
Facility Contact Person	Title	Where to Send EIQ in Future (Check One) ☐ Facility Mailing Address ☐ Parent Co. Mailing Address		

	Latitude	Longitude	UTM Coordinates		
Degrees			Zone	Easting (m)	Northing (m)
Minutes			CSTR Legal Description		
Seconds			(1/4): (1/4): Section Township Range		

Parent Company Name	Contact Person	Phone Number	
Mailing Address	City	State	ZIP Code

TOTAL PLANT EMISSIONS FROM FORM 3.0 (TONS PER YEAR)

PM10	SOx	NOx	VOC	CO	LEAD	HAPs	

The undersigned hereby certifies that they have personally examined and are familiar with the information and statements contained herein and further certifies that they believe this information and statements to be true, accurate and complete. The undersigned certifies that knowingly making a false statement or misrepresenting the facts presented in this document is a violation of state law.

Print Name of Person Completing Form	Title	Check Amount	
Signature	Date	Check Number	
Print Name of Authorized Company Representative	Title	Check Date	
Signature	Date	*OFFICE USE ONLY* Logged In By	Date Received

MO 780-1431 (11/99)

FORM 2.0C CONTROL DEVICE INFORMATION

Facility Name	FIPS County No.	Plant No.	Year of Data

***** PLEASE NOTE *****

Use this form only if the point has more than two control devices.

Point No.	AIRS ID-Pt	Source Classification Code (SCC)	Seg No.	

Device No.	Device Code	Description of Control Device	Capture Efficiency (%)	Control Device Efficiency (%)							HAP Chemical Name
				PM10	SOx	NOx	VOC	CO	LEAD	HAP(s)	

Combined Control Efficiency For Two Control Devices:

CEtot-2 = {CE1 + [(CE2 / 100) x (100 - CE1)]} x (CpE/100)

Combined Control Efficiency For Three Control Devices:

CEtot-3 = CEtot-2 + [(CE3/100) x (100 - CEtot-2)]

Note:
CEtot-x = Combined Control Efficiency for x-number of control devices.

CEx = Control Efficiency for that number (x) control device.

CpE = Capture Efficiency of Control Device 1.

Form 2.0L Landfill Worksheet

Facility Name	FIPS County No.	Plant No.	Year of Data

Point No.	AIRS ID-Pt	Source Classification Code (SCC)

Please fill out Section 1 to determine the New Source Performance Standard (NSPS) Classification.
Please fill out Sections 1 & 2 to derive VOC and HAP emission factors for the landfill.

Section (1)

Type of Landfill	Type of Control
☐ New ☐ Existing ☐ Closed	☐ Flare ☐ Control System to Reduce NMOC by 98% ☐ Enclosed Combustor ☐ None
Is Landfill Accepting Waste? ☐ Yes ☐ No	**If No, Date of last waste acceptance**
Landfill Design Capacity (Mg or cubic meters)	**Design Capacity Units** / **Age of the Landfill (yrs)** t =
Mass of solid waste in the Landfill (Mg) Throughput =	**Nonmethane Organic Compound Emission Rate (Mg/yr)**

Section (2)

Methane Generation Rate Constant (/yr) k = 0.04 /yr	**Methane Generation Potential (m3/Mg)** L = 125 m3/Mg
Time since Landfill Closure (yrs) c =	**Avg. Annual Refuse Acceptance Rate (Mg/yr)** R =
Methane Generation Rate (m3/yr) QCH4 =	**Total NMOC Conc. in Landfill gas (ppmv as hexane)** CNMOC =
NMOC Emission Rate (m3/yr) QNMOC =	**Uncontrolled NMOC Mass Emissions (lbs/yr)** MNMOC =

Uncontrolled NMOC Emissions Reported as HAPs (lbs/yr)

HNMOC =

HAP Emission Factor (lb/SCC unit) = HNMOC/[Throughput]

HAP Emission Factor =

VOC Emission Factor (lb/SCC unit)

VOC Emission Factor =

FORM 2.0S STACK INFORMATION

Facility Name	FIPS County No.	Plant No.	Year of Data

***** PLEASE NOTE *****

Use this form only if a point has more than one stack.
Provide all the stack information that is readily available.

Point No.	AIRS ID-Pt	Source Classification Code (SCC)	Seg No.	For a non-circular stack: Diameter = (1.128A)^1/2 (A = Cross Sectional Area in sq. feet)

Stack No.	AIRS ID-St	Height (Ft)	Diameter (Ft)
Temperature (F)	Velocity (Ft/Min)	Flow Rate (Cu Ft/Min)	List other points sharing this stack.

Stack No.	AIRS ID-St	Height (Ft)	Diameter (Ft)
Temperature (F)	Velocity (Ft/Min)	Flow Rate (Cu Ft/Min)	List other points sharing this stack.

Stack No.	AIRS ID-St	Height (Ft)	Diameter (Ft)
Temperature (F)	Velocity (Ft/Min)	Flow Rate (Cu Ft/Min)	List other points sharing this stack.

Stack No.	AIRS ID-St	Height (Ft)	Diameter (Ft)
Temperature (F)	Velocity (Ft/Min)	Flow Rate (Cu Ft/Min)	List other points sharing this stack.

Stack No.	AIRS ID-St	Height (Ft)	Diameter (Ft)
Temperature (F)	Velocity (Ft/Min)	Flow Rate (Cu Ft/Min)	List other points sharing this stack.

Stack No.	AIRS ID-St	Height (Ft)	Diameter (Ft)
Temperature (F)	Velocity (Ft/Min)	Flow Rate (Cu Ft/Min)	List other points sharing this stack.

Stack No.	AIRS ID-St	Height (Ft)	Diameter (Ft)
Temperature (F)	Velocity (Ft/Min)	Flow Rate (Cu Ft/Min)	List other points sharing this stack.

Duplicate this form as needed.

FORM 2.T HAZARDOUS AIR POLLUTANT WORKSHEET

Facility Name	FIPs County No.	Plant No.	Year of Data

Point No.	AIRS ID-Pt	Source Classification Code (SCC)	Seg No.

Use this form to report any HAP (Hazardous Air Pollutant) which is emitted in any amount greater than the chemical reporting levels per each emission point. The instructions for this form provide a list of the HAP's which are regulated under the Clean Air Act. THE AMOUNT EMITTED SHOULD BE REPORTED BEFORE CONTROL EQUIPMENT REDUCTIONS ARE APPLIED. Provide documentation (other worksheets, etc.) if the amount in column 3 does not equal the amount in column 4. The HAP reporting levels per emission point are as follows: Category 1 HAP's - sum of 20 pounds per year; All other HAP's - sum of 200 pounds per year.

[1] HAP Chemical	[2] CAS Number	[3] Amount used or handled (lbs/yr)	[4] Uncontrolled amount emitted (lbs/yr)	[5] Uncontrolled emissions reported as VOC or PM10 (lbs/yr)	[6] Uncontrolled emissions reported as HAPs (lbs/yr)	[7] HAP Control Device(s)	[8] Control efficiency (%)	[9] Controlled emissions reported as VOC or PM10 (lbs/yr)	[10] Controlled emissions reported as HAPs (lbs/yr)
		HAP Emission Totals = > >		Sum (Lbs/Yr)	Sum (Lbs/Yr)			Sum (Lbs/Yr)	Sum (Lbs/Yr)

11) Uncontrolled HAP Emission Factor = Sum of Uncontrolled Emissions Reported as HAPs (Column 6 Total)/ Annual Throughput (Form 2.0)	HAP Emission Factor	

Enter the HAP emission factor for all HAP chemicals that are NOT reported as VOCs or PM10 from Block 11 above as the HAP Emission Factor on Form 2.0, Emission Point Information for the associated emission point .

FORM 2.0Z OZONE SEASON INFORMATION ("EMISSIONS STATEMENT")

Facility Name	FIPS County No.	Plant No.	Year of Data

OPERATING RATE/SCHEDULE (DURING PEAK OZONE SEASON ONLY)

Point No.	AIRS ID-Pt	Source Classification Code (SCC)	Seg No.	Daily Throughput	Units

Days/Week	Weeks Of Operation	Start Time On Typical Day	End Time On Typical Day

EMISSIONS CALCULATIONS

Air Pollutant	Emission Factor	Control Efficiency (%)	Actual Emissions (lbs/day)
VOC			
NOx			
CO			

OPERATING RATE/SCHEDULE (DURING PEAK OZONE SEASON ONLY)

Point No.	AIRS ID-Pt	Source Classification Code (SCC)	Seg No.	Daily Throughput	Units

Days/Week	Weeks Of Operation	Start Time On Typical Day	End Time On Typical Day

EMISSIONS CALCULATIONS

Air Pollutant	Emission Factor	Control Efficiency (%)	Actual Emissions (lbs/day)
VOC			
NOx			
CO			

OPERATING RATE/SCHEDULE (DURING PEAK OZONE SEASON ONLY)

Point No.	AIRS ID-Pt	Source Classification Code (SCC)	Seg No.	Daily Throughput	Units

Days/Week	Weeks Of Operation	Start Time On Typical Day	End Time On Typical Day

EMISSIONS CALCULATIONS

Air Pollutant	Emission Factor	Control Efficiency (%)	Actual Emissions (lbs/day)
VOC			
NOx			
CO			

Duplicate this form as needed.

FORM 2.1 FUEL COMBUSTION WORKSHEET

Facility Name	FIPS County No.	Plant No.	Year of Data

Point No.	AIRS ID-Pt
SCC	Seg No.

[1] COMBUSTION EQUIPMENT INFORMATION

Equipment Description	Year Put in Service	Coal Firing Code No.	Maximum Design Rate (Million BTU/Hr)
Sum of Total Maximum Hourly Design Rates			

Coal Firing Method Code No.
1. Tangential
2. Opposed
3. Front
4. Dry/Wet Bottom
5. Other (Specify Below)

_____

Combustion Equipment Use (Check One)

☐ Electric Power Generation ☐ Industrial Use ☐ Commercial/Institutional ☐ Space Heating ☐ Other (Specify)

Combustion Equipment Category - Coal Use Only (Check One)

☐ Pulverized Coal ☐ Pulverized Coal Dry Bottom ☐ Pulverized Coal Wet Bottom ☐ Cyclone
☐ Fluidized Bed ☐ Spreader Stoker ☐ Overfeed Stoker ☐ Underfeed Stoker
☐ Hand Fired ☐ Other (Specify)

[2] FUEL INFORMATION

Fuel Type (Check One Only)

Oil	Gas	Coal	Other
☐ Distillate (Fuel Oil 1-4)	☐ Natural Gas	☐ Anthracite	☐ Refuse (Use Form 2.2)
☐ Residual (Fuel Oil 5-6)	☐ LPG/Propane	☐ Bituminous	☐ Trade Wastes (Use Form 2.2)
☐ Waste Oil		☐ Lignite	☐ Other (Specify)

(USE SEPARATE PAGE FOR EACH FUEL TYPE)

Fuel Identifier	Annual Throughput	Units	% Sulfur by Wt as Received *	% Ash by Wt as Received *	Heat Content (BTU/Fuel Unit)
Fuel Totals and Weighted Averages					

* Attach a copy of the current supplier statement verifying percentage of sulfur and ash contents of the fuel.

[3] CALCULATION OF MAXIMUM HOURLY DESIGN RATE

Convert the Heat Content units from BTU per Fuel Unit to Million of BTU per Fuel Unit by dividing the BTU figure by 1,000,000.

TOTAL MAXIMUM HOURLY DESIGN RATE =

{Maximum Design Rate in Million BTU/Hr} / {Heat Content in Million BTU/Fuel Unit}

Total Maximum Hourly Design Rate

Enter the total ANNUAL THROUGHPUT and total MAXIMUM HOURLY DESIGN RATE in Block 4 of Form 2.0, Emission Point Information for this fuel type. Enter the weighted average for the percent ASH/SULFUR in the PM10/SOx box in Block 8 of Form 2.0.

Duplicate this form as needed.

FORM 2.2 INCINERATOR WORKSHEET

Facility Name	FIPS County No.	Plant No.	Year of Data

[1] EQUIPMENT INFORMATION

Point No.	AIRS ID-Pt	Make/Model	Serial Number

Incinerator Use (Check One)

☐ Government ☐ Commercial ☐ Institutional ☐ Industrial ☐ Other (Specify)

Equipment Type (Check Appropriate Boxes)

☐ Pathological ☐ Sewage Sludge ☐ Multiple Chambers ☐ Controlled Air
☐ Other, Specify Below

Number of Chambers Not Including Stack	Secondary Chamber Temperature (Deg F)

Maximum Hourly Design Rate	Units/Hr	SCC No.	Seg No.	SCC Units

[2] WASTE INFORMATION AND THROUGHPUTS

Process Waste Type	Heat Content (BTU/Units)	Annual Throughput	Units
TOTAL ANNUAL THROUGHPUT =			Lbs/Yr
TOTAL ANNUAL THROUGHPUT (Tons/Yr) = {Total Annual Throughput (Lbs/Yr)} / 2000			Tons/Yr

Enter the TOTAL ANNUAL THROUGHPUT (Tons/Yr) in Block 4 on Form 2.0, Emission Point Information.

Duplicate this form as needed.

FORM 2.3 VOC PROCESS MASS-BALANCE WORKSHEET

Facility Name	FIPS County No.	Plant No.	Year of Data

Point No.	AIRS ID-Pt	Source Classification Code (SCC)	Seg No.

[1] TOTAL ANNUAL THROUGHPUT AND TOTAL POUNDS OF VOC

Application Method	Material Type	A Annual Throughput (SCC Units/Yr)	B % by Wt of VOC in Material	C Density (Lbs/Gal)	D Lbs of VOC per Unit	E VOC (Lbs/Yr)

Enter the TOTAL ANNUAL THROUGHPUT amount calculated to the right, in Block 4 Annual Throughput on Form 2.0.	TOTAL ANNUAL THROUGHPUT (SCC Units)	If A is in gallons, then B x C = D If A is in tons, then B x 2000 = D A x D = E	TOTAL VOC (Lbs/yr)

[2] CALCULATION OF VOC RECOVERED

LBS OF VOC RECOVERED =
{Material Shipped as Hazardous Waste} x {% VOC Content of Waste}

Material Shipped as Hazardous Waste	% VOC Content of Waste	Lbs of VOC Recovered

Documentation must be supplied to support the amount of material shipped and the % VOC Content.

[3] CALCULATION OF VOC EMITTED PRIOR TO CONTROL

LBS OF VOC EMITTED PRIOR TO CONTROL EQUIPMENT =

{Total Lbs of VOC} - {Lbs of VOC Recovered}

Lbs of VOC Emitted Prior to Control

[4] CALCULATION OF EMISSION FACTOR

EMISSION FACTOR =

{Lbs of VOC Emitted Prior to Control Equipment} / {Total Annual Throughput}

Emission Factor in Lbs/Unit

Enter the EMISSION FACTOR in VOC Box of Block 7 on Form 2.0, Emission Point Information.

Duplicate this form as needed.

FORM 2.4 PETROLEUM LIQUID LOADING WORKSHEET

******* NOTE *******

This form should be used to calculate the emissions from loading organic liquids into tank trucks, rail tank cars and barges. Form 2.5 should be used to calculate the Load In-Load Out emissions from storage tanks.

Facility Name	FIPS County No.	Plant No.	Year of Data

[1] LOADING INFORMATION

Point No.	AIRS ID-Pt	Source Classification Code (SCC)	Seg No.

Annual Throughput of Liquid (1,000 Gallons)	Control Device Type	Control Efficiency (%)

Type of Loading

- ☐ Splash Loading
- ☐ Submerged Loading
- ☐ Bottom Loading
- ☐ Other, Please Specify Below

[2] CHEMICAL INFORMATION

Bulk Liquid Type	Molecular Wt of Material Loaded (Lb/Lb-Mole)

True Vapor Pressure of Bulk Liquid (Psia)	Saturation Factor

Temperature of Liquid (Deg R) = Degrees Fahrenheit + 460 Degrees Fahrenheit

[3] LOADING LOSS EMISSION FACTOR CALCULATION

LOADING LOSS EMISSION FACTOR =

12.46 x {Molecular Wt} x {True Vapor Pressure} x {Saturation} / {Temperature (Deg R)}

Loading Loss Emission Factor	Units Lbs per 1000 Gallons

Enter the Control Efficiency (%) from Section 1 in Block 3 of Form 2.0. Enter the Annual Throughput of Liquid from Section 1, expressed in thousands of gallons, in Block 4 on Form 2.0. Enter the Loading Loss Emission Factor (Block 3) in the VOC Box of Block 7 on Form 2.0.

REMEMBER when calculating emissions, use a SEPARATE Form 2.0, Emission Point Information, for each type of liquid loaded in the tank during the year. Use the same Point Number but with the SCC that corresponds to the different liquid type.

FORM 2.5 ORGANIC LIQUID STORAGE - FIXED ROOF TANK

Facility Name	FIPS County No.	Plant No.	Year of Data

Please provide all the following information if this form is being used to derive emission factors for a liquid storage tank with capacities greater than 250 gallons. Form 2.5L may be used to provide tank information for other sources of emission factors. Please include all organic liquids, petroleum products or fuels.

[1] TANK INFORMATION

Point (Tank) Identification No.	AIRS ID-Pt	Color (Roof)	Color (Shell)

Diameter (Ft)		Paint Condition	Solar Absorptance

Height (Ft)	Length (Ft)	Type of Roof ☐ Cone ☐ Dome ☐ Other (Specify)	Roof Height (Ft)

Capacity (in Thousands of Gallons)			Vapor Space Outage (Ft)

Vent Pressure Setting	Vent Vacuum Setting	Total Solar Insolation Factor (BTU/Sq Ft)

[2] CHEMICAL INFORMATION

Chemical		Working Loss Product Factor	

Vapor Molecular Wt	CAS Number	LBT (Rankine)	D-Min-AT (Rankine)

LST - [Average Liquid Surface Temperature (Rankine)] Avg: Max: Min:		DVTR (Rankine)	D-Max-AT (Rankine)

VP - [Vapor Pressure at LST (psia)]		DVPR (psi)	D-Avg-AT (Rankine)

Throughput (in Thousands of Gallons)		Number of Turnovers	Turnover Factor

[3] VOC EMISSION CALCULATIONS

BREATHING LOSS (Lbs/Yr)

BREATHING LOSS = 26.714 x {Diameter}^2 x {Vapor Space Outage} x {Vapor Molecular Weight} x {VP} x [({DVTR} / {LST}) + [({DVPR} - ({Vent Pressure Setting} - {Vent Vacuum Setting})) / (14.7 - {VP})]] / [{LST} x [1 + (0.053 x {VP} x {Vapor Space Outage})]]

=

WORKING LOSS (Lbs/Yr)

WORKING LOSS = 0.0238 x {Vapor Molecular Wt} x {VP} x {Throughput} x {Turnover Factor} x {Working Loss Product Factor}

=

BREATHING LOSS EMISSION FACTOR (Lbs VOC per 1,000 Gallons Capacity) and SCC

BREATHING LOSS EMISSION FACTOR = {Breathing Loss} / {Capacity}	Breathing Loss SCC
=	

WORKING LOSS EMISSION FACTOR (Lbs VOC per 1000 Gallons Stored) and SCC

WORKING LOSS EMISSION FACTOR = {Working Loss} / {Throughput}	Working Loss SCC
=	

Enter the CAPACITY (Breathing Loss) and THROUGHPUT (Working Loss) as the ANNUAL THROUGHPUT in Block 4 on separate Forms 2.0 making sure the SCC matches the Breathing Loss and Working Loss. Also enter the calculated BREATHING LOSS EMISSION FACTOR and WORKING LOSS EMISSION FACTOR in the VOC Box in Block 7 of the respective Form 2.0.

Duplicate this form as needed.

FORM 2.5L GENERAL LIQUID STORAGE TANK INFORMATION

Facility Name	FIPS County No.	Plant No.	Year of Data

Point or Tank ID No.	AIRS ID-Pt	Diameter (Ft)	Height/Length	SCC (Breathing)	SCC (Working)
Capacity (1,000 Gallons Capacity)		Throughput (1,000 Gallons)		Tanks Program Used? ☐ Yes ☐ No	
Chemical		CAS Number		Choose Type of Tank: ☐ Fixed Roof ☐ Floating Roof	☐ Vertical ☐ Horizontal

Point or Tank ID No.	AIRS ID-Pt	Diameter (Ft)	Height/Length	SCC (Breathing)	SCC (Working)
Capacity (1,000 Gallons Capacity)		Throughput (1,000 Gallons)		Tanks Program Used? ☐ Yes ☐ No	
Chemical		CAS Number		Choose Type of Tank: ☐ Fixed Roof ☐ Floating Roof	☐ Vertical ☐ Horizontal

Point or Tank ID No.	AIRS ID-Pt	Diameter (Ft)	Height/Length	SCC (Breathing)	SCC (Working)
Capacity (1,000 Gallons Capacity)		Throughput (1,000 Gallons)		Tanks Program Used? ☐ Yes ☐ No	
Chemical		CAS Number		Choose Type of Tank: ☐ Fixed Roof ☐ Floating Roof	☐ Vertical ☐ Horizontal

Point or Tank ID No.	AIRS ID-Pt	Diameter (Ft)	Height/Length	SCC (Breathing)	SCC (Working)
Capacity (1,000 Gallons Capacity)		Throughput (1,000 Gallons)		Tanks Program Used? ☐ Yes ☐ No	
Chemical		CAS Number		Choose Type of Tank: ☐ Fixed Roof ☐ Floating Roof	☐ Vertical ☐ Horizontal

Point or Tank ID No.	AIRS ID-Pt	Diameter (Ft)	Height/Length	SCC (Breathing)	SCC (Working)
Capacity (1,000 Gallons Capacity)		Throughput (1,000 Gallons)		Tanks Program Used? ☐ Yes ☐ No	
Chemical		CAS Number		Choose Type of Tank: ☐ Fixed Roof ☐ Floating Roof	☐ Vertical ☐ Horizontal

Point or Tank ID No.	AIRS ID-Pt	Diameter (Ft)	Height/Length	SCC (Breathing)	SCC (Working)
Capacity (1,000 Gallons Capacity)		Throughput (1,000 Gallons)		Tanks Program Used? ☐ Yes ☐ No	
Chemical		CAS Number		Choose Type of Tank: ☐ Fixed Roof ☐ Floating Roof	☐ Vertical ☐ Horizontal

Duplicate this form as needed.

FORM 2.6 ORGANIC LIQUID STORAGE - FLOATING ROOF TANK

Facility Name	FIPS County No.	Plant No.	Year of Data

Please provide all the following information if this form is being used to derive emission factors for a liquid storage tank with capacities greater than 250 gallons. Please include all organic liquids and petroleum products or fuels.

[1] TANK INFORMATION

Point or Tank ID No.	AIRS ID-Pt	Type of Construction	Primary Seal
		☐ Riveted ☐ Welded	☐ Metallic Shoe ☐ Liquid-Mounted ☐ Vapor Mounted
Capacity (in Thousands of Gallons)		Type of Roof ☐ Internal ☐ External	
Diameter (Ft)		Length of Seam (Ft)	Secondary Seal ☐ None ☐ Shoe-Mounted ☐ Rim-Mounted ☐ Weather Shield
Seal Factors, a & b		Number of Columns	
Clingage Factor		Effective Column Diameter (Ft)	Area of Deck (Sq Ft)
			Total Fitting Loss Factor (Lb-Mole/Yr)
Shell Condition ☐ Light rust ☐ Dense rust ☐ Gunite lined		Deck ☐ Bolted ☐ Welded	Seam Loss Factor (Lb-Mole/Ft-Yr)

[2] CHEMICAL INFORMATION

Chemical	Throughput (1,000 Gal/Yr)	Vapor Pressure at Storage Temp (psia)
Vapor Molecular Wt	Number of Turnovers	Vapor Pressure Function = [{Vapor Pressure} / 14.7] / [1 + (1 - ({Vapor Pressure} / 14.7))^0.5]^2
Liquid Density (Lb/Gal)	Product Factor	=

[3] METEOROLOGICAL CONDITIONS

Average Wind Speed (Mph)	Seal Related Wind Exponent	Average Ambient Temperature (F)

[4] VOC EMISSION CALCULATIONS

RIM SEAL LOSS (Lbs/Yr)	WITHDRAWAL LOSS (Lbs/Yr)
RIM SEAL LOSS = ({Seal Factor, a} + {Seal Factor, b} x {Avg Wind Speed}^{Seal Related Wind Exponent}) x {Diameter} x {Vapor Molecular Wt} x {Product Factor} x {Vapor Pressure Function}	WITHDRAWAL LOSS = 0.943 x ({Throughput} x 23.81) x {Clingage Factor} x {Liquid Density} / {Diameter} x [1 + ({No. of Columns} x {Effective Column Diameter} / {Diameter})]
=	=

DECK FITTING LOSS (Lbs/Yr)	DECK SEAM LOSS (Lbs/Yr)
DECK FITTING LOSS = {Total Deck Fitting Loss Factor} x {Molecular Wt} x {Product Factor} x {Vapor Pressure Function}	DECK SEAM LOSS = {Diameter}^2 x {Length of Seam} / {Area of Deck} x {Seam Loss Factor} x {Molecular Wt} x {Product Factor} x {Vapor Pressure Function}
=	=

WORKING LOSS EMISSION FACTOR	SCC	BREATHING LOSS EMISSION FACTOR
WORKING LOSS EMISSION FACTOR = {Withdrawal Loss} / {Throughput}	Working Loss SCC	BREATHING LOSS EMISSION FACTOR = ({Rim Seal Loss} + {Deck Fitting Loss} + {Deck Seam Loss}) / {Capacity}
	Breathing Loss SCC	
=		=

Duplicate this form as needed.

FORM 2.7 HAUL ROAD FUGITIVE EMISSIONS WORKSHEET

Facility Name	FIPS County No.	Plant No.	Year of Data

***** PLEASE NOTE *****

If the sum of all Vehicle Miles Traveled (VMT) for all haul roads and trucks is less than 100 VMT, then the PM10 emissions for all the haul roads do not need to be reported on these forms. However, if the emissions are not reported, documentation on the actual annual VMT figures for the facility must be provided.

[1] HAUL ROAD INFORMATION

Point No.	AIRS ID-Pt	SCC	Seg No.	Type of Dust Control (Check One)	Control Eff %
				☐ Surfactant Spray	90
				☐ Water Spray Documented	> 50
				☐ Water Spray	50
				☐ No Controls	0
				☐ Other (Specify)	

Length of Road (Miles)	Silt Content (%) (Default = 8.3 %)	Surface Material of Road

Surface Material Moisture Content (%) (must reference dry, worst-case conditions) (Default = 0.2 %)	Days of Rain with at least 0.01" per Year (Default = 105 Days)

[2] HAUL TRUCK INFORMATION

Make/Model	Unloaded Truck Wt (Tons)

Average Wt of Material per Load (Tons)	Average Loaded Truck Wt (Tons)

Average Truck Speed (MPH)

[3] MATERIAL HAULED

Type of Material(s) Hauled	List any permit conditions limiting the amount hauled.

Annual Amount Hauled (Tons)	Maximum Hourly Amount Hauled (Tons)

[4] CALCULATION OF ANNUAL VEHICLE MILES TRAVELED (VMT)

ANNUAL VMT =

2 x {Length of Haul Road} x {Annual Amount Hauled} / {Average Wt of Material per Load}

Annual VMT	Reportable Level = the Sum of all Road VMTs > 100	Maximum Hourly VMT

[5] Calculation of Haul Road Emission Factor

PM10 EMISSION FACTOR =

2.6 x ({Silt Content (%)} / 12)^0.8 x [({Unloaded Truck Wt} + {Average Loaded Truck Wt}) / 6]^0.4 x [(365 - {Days of Rain}) / 365] / [{Surface Material Moisture Content (%)} / 0.2]^0.3

*** If Average Truck Speed is < 15 (MPH), multiply the equation by (Average Truck Speed / 15)**

PM10 Emission Factor

Lbs PM10 / VMT

The PM10 emission factor for the haul roads can be calculated using the equation from the AP 42 section on Unpaved Haul Roads (Section 13.2.2) provided in Block 5 of this worksheet. When using these equations, PM10 emission factors should be calculated for each separate haul road and type of haul truck. The Stone Quarrying SCC number (3-05-020-11) should be used as the SCC number on Form 2.0. The calculated PM10 emission factor should be entered in the PM10 Box in Block 7 on Form 2.0.

A more detailed discussion on dust control method and the the resulting Control Efficiency (%) can be found in the AP 42 Section 13.2.2. The appropriate dust control method should be checked in Block 1 and the control efficiency should be entered in the PM10 box of Block 9 on Form 2.0.

ALTERNATE METHODS TO ESTABLISH THE HUAL ROAD PM10 EMISSION FACTOR

Instead of using this form to calculate the PM10 emission factor for haul roads, the Source Classification Code (SCC) for Stone Quarrying and Processing Haul Road Emissions (3-05-020-11) may be used as a default SCC number. The PM10 emission factor to use with this SCC number is 6.2 Lbs of PM10 per VMT.

FORM 2.8 STORAGE PILE WORKSHEET

Facility Name	FIPS County No.	Plant No.	Year of Data

[1] STORAGE PILE INFORMATION

Point No.	AIRS ID-Pt	SCC	Seg No.	Type of Material Stored

Moisture Content (%) (Default = 0.7 %)	Area of Storage Pile (Acres)	
Silt Content (%) (Default = 1.6 %)	Raw Material Loading Method (Check One) ☐ Barge ☐ Rail ☐ Truck ☐ Conveyor ☐ Other (Specify)	Raw Material Unloading Method (Check One) ☐ Barge ☐ Rail ☐ Truck ☐ Conveyor ☐ Other (Specify)
Storage Duration (Days)		
Annual Amount Stored (Tons)		
Maximum Hourly Amount Stored		

[2] OTHER FACTORS AFFECTING EMISSION RATES

Mean Wind Speed (Mph) (Default = 10 Mph)	% of Time Wind > 12 Mph (Default = 32 %)
Dry Days per Year (Default = 260 Days)	Vehicle Activity Factor (Default = 1.0)

[3] STORAGE PILE EMISSION FACTOR CALCULATIONS

[3-A-1] LOAD IN-LOAD OUT FACTOR =

.00224 x ({Mean Wind Speed} / 5)^1.3 / ({Moisture Content (%)} / 2)^1.4

Load In-Load Out Factor

[3-A-2] VEHICLE ACTIVITY FACTOR =

0.05 x ({Silt Content (%)} / 1.5) x ({Dry Days per Year} / 235) x {Vehicle Activity Factor}

Vehicle Activity Factor

[3-B] WIND EROSION FACTOR =

0.85 x ({Silt Content (%)} / 1.5) x ({Storage Duration(Days)} x ({Dry Days per Year} / 235) x ({% of Time Wind > 12 mph} / 15) lb/acre

Wind Erosion Factor

[4] STORAGE PILE PM10 EMISSION FACTOR

ACTIVITY PM10 EMISSION FACTOR =
{[3-A-1] Load In-Load Out Factor} + {[3-A-2] Vehicle Activity Factor}

[4-A] Activity PM10 Emission Factor	[4-B] Wind Erosion PM10 Emission Factor
lb PM10/Ton	lb PM10/Acre

***** PLEASE NOTE *****

If you use a Source Classification Code (SCC) number and Emission Factor from the list in the instructions for this form, make sure to complete Block 1, Storage Pile Information for each storage pile.

Duplicate this form as needed.

FORM 2.9 STACK TEST/CONTINUOUS EMISSION MONITORING WORKSHEET

Facility Name	FIPS County No.	Plant No.	Year of Data

Point No.	AIRS ID-Pt	Source Classification Code (SCC)	Seg No.	Stack No.	AIRS ID-St

Pollutant Tested	CAS Number	NOTE: Use a separate worksheet for each pollutant tested.

[1] EMISSION SOURCE INFORMATION

Equipment Make/Model

Type of Control Device	Control Efficiency (%)

Limitations on emissions, production or operating time (if any)

[2] STACK TEST INFORMATION

Testing Firm Name and Address	EPA Method(s) Used

Test Date(s)	Results	Compliance ☐ Yes ☐ No

Test Technique (Check One) ☐ Operational Rate ☐ Maximum Design Rate ☐ Both	Latest Calibration of Testing Equipment

Agency Observing Test ☐ EPA ☐ MO DNR ☐ Other	Name of Observer(s)

[3] CONTINUOUS EMISSION MONITORING INFORMATION

Concentration of Pollutant	Units	Flow Rate of Stack	Units

Latest Calibration of Monitor	Results of Calibration

Monitor Averaging Period	% Monitor Down Time

[4] EMISSION FACTOR CALCULATION

Emission Rate *	Units Lbs/Hr	*NOTE: Documentation should include summary page information from the test data to verify the emission and production rate.
Production Rate *	Units/Hr	

EMISSION FACTOR =
[{Emission Rate} / {Production Rate}] / [1 - [Control Efficiency (%)} / 100]

Emission Factor	Units

Enter the EMISSION FACTOR in the appropriate box in Block 7 on Form 2.0, Emission Point Information.
If applicable, enter the CONTROL DEVICE TYPE and CONTROL EFFICIENCY (%) in Block 3 on Form 2.0.

Duplicate this form as needed.

EMISSIONS INVENTORY QUESTIONNAIRE (EIQ)

INSTRUCTIONS

2002

Missouri Department of Natural Resources
Air and Land Protection Division
Air Pollution Control Program

Post Office Box 176
205 Jefferson Street, Room 120
Jefferson City, Missouri 65102

Telephone: (573) 751-4817

TABLE OF CONTENTS

OVERVIEW OF EIQ FORMS

The EIQ (Emissions Inventory Questionnaire) consists of required forms and supplemental worksheets. Worksheets are process specific and required only if a facility has the applicable process. As one of the first steps to completing the EIQ, be sure to review this overview section to determine which forms are applicable to your emissions report.

There are four (4) local air pollution control agencies in Missouri that have jurisdiction over sources in their areas. The four are City of St. Louis, St. Louis County, Kansas City (which includes parts of Clay, Jackson, and Platte counties) and City of Springfield (part of Greene County). If your facility is located in one of the local air agency jurisdictions, please contact the appropriate agency for EIQ forms and EIQ related questions. Your local agency may have different regulations and reporting requirements.

The **criteria pollutant** reporting level for each **point** is 200 pounds (0.1 tons) of total emissions. For example, if there are 50 pounds of PM_{10}, 50 pounds of SO_x, and 100 pounds of NO_x, a total emission of 200 pounds, then the emission point is reportable. Not all **Hazardous Air Pollutants** (HAP) have the same reporting level as the criteria pollutants. See Form 2.T instructions for a list of the HAP reporting levels. If the point is not reportable, i.e., the emissions are below the respective reporting level, a Form 2.0 is not needed for that particular point; however, the point must be indicated on the process flow diagram (Form 1.1).

Similar processes could be grouped when certain conditions are met and reported as one emission point. However, not grouping similar processes to avoid reporting an emission point is not allowed. Further discussion on Criteria Pollutants, Reporting Levels, and Grouping can be found in the Glossary.

Total Suspended Particulate (TSP) emissions are not to be reported, as TSP is no longer a criteria pollutant.

Many facilities received preprinted EIQ forms. Air Pollution Control personnel may have made corrections that appear in the preprinted information. Corrections should not be changed without explanation.

If there are forms in your packet that do not require your submittal; please **DO NOT RETURN** the unused forms. In addition, since there have been minor changes on some forms, please do not use any forms from previous years.

The information provided in the returned EIQs will have a number of uses. The most obvious are to calculate emissions and determine fees. Other uses include meeting and/or monitoring permit requirements, providing data for modeling studies and providing an indication of air quality within the state.

Form 1.0 GENERAL PLANT INFORMATION
(Required for all facilities.)

This form includes general plant information, a plant emissions total, and a signature section certifying that the submitted information is accurate and complete.

Form 1.0P COMPANY INFORMATION - PORTABLE EQUIPMENT
(Required for all portable facilities.)

This form contains parent company mailing address information for portable equipment. This form is to be used instead of the Form 1.0 General Plant Information.

Form 1.1 PROCESS FLOW DIAGRAM
(Required for all facilities.)

This form outlines the facility's processes and emission points in a flow chart format. The process flow diagram identifies all processes, air pollution emission points, and air pollution control devices for a facility.

Form 1.2 SUMMARY OF EMISSION POINTS
(Required for all facilities.)

This form lists all emission points and associated processes identified on the Process Flow Diagram.

Form 2.0 EMISSION POINT INFORMATION
(Required for all facilities.)

This form is the **main emissions reporting form.** The actual emissions from a point are recorded on this form. A separate Form 2.0 must be completed for each emission point listed on Form 1.2. Some emission points may need more than one SCC (Source Classification Code); an example is a boiler burning two fuels. If this is the case, please indicate both SCCs on Form 1.2 and complete a Form 2.0 for each additional SCC under the same emission point.

Form 2.0C CONTROL DEVICE INFORMATION
(Required only if there are more than two control devices at an emissions point.)

This form provides control device information when there are three or more control devices operative at an emission point, or if a facility reports separate control efficiencies for different Hazardous Air Pollutants. Space limitations on Form 2.0 permit the description of only two control devices.

FORM 2.0L Landfill Information
(Required only if facility has or is a landfill.)

This form is used along with the Form 2.T to calculate the Methane, Non-Methane, and HAP emissions from an operating or closed landfill. An EIQ for a landfill is not required if it accepted no waste after November 8, 1987.

FORM 2.0P PORTABLE PLANTS
(Required only of portable facilities such as rock crushers.)

This form describes the unique characteristics of portable plants and lists all operating sites for the past year.

Form 2.0S Stack Information
(Required only if there are two or more stacks/vents at an emission point.)

This form provides stack information for points where emissions from a process enter the ambient air through two or more stacks/vents. Form 2.0 provides space for detailing information on only one stack.

FORM 2.0Z Ozone Season Information Form
(Required only of certain facilities within the St. Louis Nonattainment Area.)

The applicable area consists of St. Louis, St. Charles, Franklin and Jefferson counties and St. Louis City. A facility within this geographical area is required to submit Form 2.0Z if 10 tons or more of VOC, NO_x or CO are emitted annually.

Form 2.1 Fuel Combustion Worksheet
(Required of all facilities with on-site boilers.)

This form is used to describe the combustion equipment, fuel usage, and the calculations associated with combustion processes.

Form 2.2 Incinerator Worksheet
(Required of all facilities with an on-site incinerator.)

This form is used to describe the incinerator, list the waste material(s) incinerated, and report the annual waste material throughput. A separate Form 2.2 is required for each incinerator.

Form 2.3 VOC PROCESS MASS-BALANCE WORKSHEET
(Required only if a mass-balance calculation is used to calculate an emission factor for an emission point emitting only volatile organic compounds (VOCs).

This form provides documentation of the VOC emission factor determination. A separate Form 2.3 must be filled out for each VOC emission point for which mass-balance calculations are used to derive an emission factor.

Form 2.4 PETROLEUM LIQUID LOADING WORKSHEET
(Required only if a facility needs to calculate the emission factor for petroleum liquid loading into tank trucks, rail cars, and barges.)

This form is **NOT** to be used to calculate emission factors for loading or unloading of material in or out of storage tanks. A separate Form 2.4 must be used for each petroleum liquid loading terminal for which an emission factor is calculated.

One of the following three (3) forms is required of all facilities having one or more tanks with a storage capacity greater than 250 gallons.

Form 2.5 ORGANIC LIQUID STORAGE - FIXED ROOF TANK
Form 2.5L GENERAL LIQUID STORAGE TANK INFORMATION
Form 2.6 ORGANIC LIQUID STORAGE - FLOATING ROOF TANK

Form 2.5L is used to report breathing or working loss emissions from storage tanks if either SCC emission factors or the TANKS program factors are applied. This is the simplest tank worksheet and is applicable to both fixed and floating roof tanks.

Forms 2.5 and 2.6 will be used if, instead of applying SCC factors or the TANKS program, working and breathing loss emission factors are calculated. A separate form must be filled out for each tank and each chemical stored in the tank.

Form 2.5 is used to provide information on fixed roof storage tanks and to document calculations used to determine working and breathing losses and emission factors. Storage tanks which store the same chemical may be grouped and reported as one emission point.

Form 2.6 is used to provide information on floating roof storage tanks and to document calculations used to determine VOC losses from withdrawal, fittings, seams and the calculation of emission factors.

Form 2.7 Haul Road Fugitive Emissions Worksheet
(Required for all facilities with greater than 100 vehicle miles traveled for all haul roads.)

This form is used to provide information on haul roads and, if the SCC emission factor is not applied, to document the calculations used to generate a haul road emission factor. If Form 2.7 is

used to calculate the haul road emission factor, then the entire form must be completed for that haul road.

The instructions specific to Form 2.7 describe the information required if Form 2.7 is not used to document calculations.

Form 2.8 STORAGE PILE WORKSHEET
(Required for any facility with a raw material or finished products stored in an open storage pile located within the plant boundaries.)

This form is used to provide information on a storage pile and to document the calculations used to determine a storage pile emission factor. If Form 2.8 is used to calculate the storage pile emission factor, then the entire form must be completed for that storage pile.

Form 2.9 STACK TEST/CONTINUOUS EMISSION MONITORING WORKSHEET
(Required only if stack tests or continuous emission monitoring results are used to derive emission factors.)

This form is used to document emission factor calculations. A separate Form 2.9 must be supplied for each emission point and pollutant for which stack test or continuous emission monitoring data was used to derive an emission factor.

Form 2.T HAZARDOUS AIR POLLUTANT WORKSHEET
(Required of all facilities that emit more than the specified level of one or more of the 189 HAPs (Hazardous Air Pollutants) chemicals listed in the 1990 revisions to the Clean Air Act.)

This form is used to provide information on the HAP chemicals emitted throughout a facility. This form is used to separate out and list the individual HAPs that have already been reported as VOC/PM_{10} emissions. This form may also be used to calculate **point level** HAP emission factors.

One of the following Form 3.0s is required for all facilities.

Form 3.0 EMISSION FEE CALCULATION
(Required for all facilities unless using one of the alternative forms.)

This form lists and totals the air pollutant emissions determined on each Form 2.0. This form is also used to determine the amount your facility will pay in emission fees to the Missouri Air Pollution Control Program.

Form 3.0 CK EMISSION CALCULATION
(Required for all charcoal kilns facilities.)

Form 3.0 KC EMISSION FEE CALCULATION (KC) and
Form 3.0 STLC EMISSION FEE CALCULATION (STLC)
(Required for all facilities located within the jurisdiction of the Kansas City Health Department or the St. Louis County Department of Health, respectively.)

These forms are the same as the Form 3.0 previously described but they also deduct any air emissions fee for the calendar year of record paid to either the Kansas City Health Department or the St. Louis County Department of Health. Please contact your local agency if the emissions fee paid to the local agency was based on CO (carbon monoxide) emissions.

Form 4.0 FINANCIAL COST ESTIMATE
(Required for all facilities.)

This form is used to track any additional costs incurred by your facility within the last year to implement the Missouri Air Law or the federal Clean Air Act, as amended.

DRY CLEANER REGISTRATION FORM
(Required if facility has a Dry Cleaner on Site.)

In most cases, this form will be used instead of the general EIQ for dry cleaners.

GLOSSARY

^: This symbol is used in mathematical equations. It means to raise the preceding quantity to the indicated power.

Example 1: 36^.5 means that 36 is to be raised to the .5 (or ½) power; i.e., find the square root of 36.

Example 2: 125^(1/3) = 5 since 5x5x5 = 125.

AIRS ID - Pt:

This is a three-character emission point identifier assigned by the Air Pollution Control Program (APCP) staff. It is the Point Number in the Environmental Protection Agency's Aerometric Information Retrieval System (AIRS) - Facility Subsystem database. Once assigned this number it should remain constant from year to year, even if the Point ID supplied by the facility changes.

AIRS ID - St:

This is a three-digit stack identifier supplied by APCP staff. It is used as the Stack Number in the Environmental Protection Agency's Aerometric Information Retrieval System (AIRS) - Facility Subsystem database. Once this number is assigned to a stack this number should remain constant from year to year, even if the Stack No. supplied by the facility changes.

Allowable Emission Rate:

The emission rate calculated using the maximum rated capacity of the installation (unless the source is subject to enforceable permit conditions which limit the operating rate or hours of operation, or both) and the most stringent of the following:

1) emission limit established in any applicable emission control rule including those with a future compliance date,
2) the emission rate specified as a permit condition.

For example: An installation has an emission unit which has process inputs of 40 tons per hour along with potential PM10 emissions of 50 pounds per hour. State Regulation 10 CSR 10-3.050, "Restriction of Emission of Particulate Matter From Industrial Processes," restricts the level of potential emission rate from a process with inputs of 40 tons per hour to a maximum of 42.5 pounds per hour. The 42.5 pound per hour value is said to be the allowable emission rate for this emission unit.

The installation, at a minimum, would have to restrict the potential emissions from the emission unit to a potential emission rate of 42.5 pounds per hour. The limitation on the potential emissions would have resulted from applying a "Federally Enforceable Condition" on the Emission Unit.

Basic State Installation:

A facility which emits greater than de minimis levels of any criteria pollutant or is subject to any limitation, standard, or other requirement (regardless of emission rate) under section 111 or 112 (with the exception of 112(r)) of the Clean Air Act but does not meet the criteria for **Part 70 installations**.

Breathing Loss (also called *standing loss*):

Breathing loss occurs daily when a liquid is stored in a tank. Breathing loss for a product such as gasoline is due to evaporation and barometric temperature changes. The frequency with which gasoline is withdrawn from the tank, allowing fresh air to enter and enhance evaporation, also has a major effect on the quantity of emissions.

CAS #: Chemical Abstract Service Registry Number

CFR: Code of Federal Regulations

Classification:

This describes the system used by the Air Pollution Control Program (APCP) for enforcement purposes to recognize broad differences between pollution generating sources within the state. All classifications are determined by potential emissions, the amount of emissions that would be generated if a facility operated at 100% of its rated capacity 24 hours a day for 365 days a year (8760 hours). Removal of control is used to further differentiate between source classification. Uncontrolled emissions result when no air pollution control measures are in effect at an emission point. The following table outlines the definitions of the various source classifications for either criteria or hazardous air pollutants (HAPs) emissions.

Class	Emissions in tons/year
A1	Potential >= 100 for any pollutant
A2	Uncontrolled Potential >= 100 for any pollutant
A3	Potential >= 10 for any HAP or Potential >= 25 for any combination of HAPs
B	Uncontrolled Potential >= de minimis level for any pollutant
D	Uncontrolled Potential < de minimis levels for all pollutants.

CO: Carbon Monoxide

Control Device:

Equipment or process used to remove or prevent air contaminants from being emitted from an air pollution generating process.

County #:

The Four Digit County Number is being replaced with the THREE Digit FIPS County Number. Each county within the state has been assigned a unique number by the federal government. The lowest and highest, 001 and 229, are assigned to Adair and Wright counties, respectively. Every facility in New Madrid county, for example, will be assigned a county number of 143. Portable sources are given a county number of 777.

Criteria Pollutants:

The pollutants regulated by the Clean Air Act under Section 108 are:

PM10 - Particulate Matter less than 10 microns in diameter
NOx - Nitrogen Oxide Compounds
SOx - Sulphur Oxide Compounds

VOC - Volatile Organic Compounds
Lead - Lead (Pb)
CO - Carbon Monoxide

CSR: Code of State Regulations

Degrees R:

Degrees Rankine = F (Fahrenheit) degrees + 460 degrees F. The volume of a gas will theoretically vanish at absolute zero or -460 degrees Fahrenheit. Absolute temperatures determined by using Fahrenheit units are expressed as degrees Rankine.
Example: 10 degrees F = (10 + 460) degrees Rankine = 470 degrees R.

De minimis Levels:

The level of emissions from an installation at which APCP considers the installation significant. These facility-wide tons per year levels are:

CO	-	100	Lead	-	0.6
PM10	-	15	HAPs (Individual)	-	10
SOx	-	40	HAPs (Combined)	-	25
NOx	-	40			
VOC	-	40			

Example: Suppose annual PM10 emissions from Facility X are 20 tons but total emissions of all other criteria pollutants are below de minimis levels. Because the PM10 de minimis level is exceeded, Facility X must report the PM10 emissions and the total emissions of each criteria and HAP pollutant.

Emission Factor:

An average value that relates the quantity of a pollutant released to the atmosphere with the amount of activity associated with the process releasing that pollutant. Such factors can be used to estimate the emissions from various sources generating air pollution. An emission factor for natural gas combustion is 3.0 lbs of PM10 per Million Cubic Feet (MMCF) of gas burned. An emission factor for a haul road can be 2.7 lbs. of PM10 per Vehicle Miles Traveled (VMT).

EIQ: Emissions Inventory Questionnaire

Emission Point:

Any specific point or installation where an air pollutant is released from a process or operation into the ambient air.

Example: Suppose the first emission point at a facility is a 30 foot stack which emits pollutants from a boiler, the stack could be labeled EP1. The boiler would be the process producing air pollutants, so an appropriate Source Classification Code (SCC) would be chosen to reflect that the boiler is one process under this emission point.

Emission Release Point

An Emission Release Point is the point at which pollutants are released into the ambient air. This emission may be fugitive or it may be vented through a device such as a stack.

Emission Unit:

Any part or activity of an installation that emits or has the potential to emit any regulated air pollutant or any pollutant listed under section 112(b) of the Act (10 CSR 10-6.020). For the purposes of the operating permit application, an emission unit is a sub-point of an emission point from the Emissions Inventory Questionnaire.

For example, an EIQ for Facility B lists Emission Point 1 as a stack which emits pollutants from two boilers and a kiln. The three emission units are boiler 1, boiler 2, and the kiln.

Facility:

For the purposes of EIQ and operating permit application only, facility and installation are interchangeable terms. (see **Installation** for further information).

Federally-Enforceable Conditions:

All limitations and conditions which are enforceable by the administrator for Region VII of the United States Environmental Protection Agency, including those requirements developed pursuant to 10 CSR 10-6.070 or 6.080, requirements within any applicable state implementation plan, any construction permit requirements established pursuant to 10 CSR 10-6.060, including operating permits issued under an EPA-approved program that is incorporated into the state implementation plan and expressly requires adherence to any permit issued under the program (10 CSR 10-6.065). Voluntary conditions proposed in the operating permit application will become federally-enforceable when the operating permit is finally issued.

FIPS County #: See County #.

Grouping Emission Units:

Under certain conditions processes may be grouped together and reported under one emission point. The processes must be the same (or quite similar) and, if control devices are operative on emissions from any process, all processes must be controlled. In addition, any control devices must remove specific pollutants with the same efficiencies at all processes. Typically the emissions generated by each process are "small" or the processes are so similar that reporting them as distinct points adds little or nothing to the EIQ. Examples of common groupings are space heaters, all of which burn the same fuel; limestone chat haul roads carrying similar types of vehicular traffic; and multiple dump pits at a grain elevator.

Hazardous Air Pollutant (HAP):

Any of the air pollutants listed in 10 CSR 10-6.020(3)(C). A copy of this list is provided in the appendix.

Intermediate State Installation:

A facility that would meet the emissions criteria for a **Part 70 installation**, except for the imposition of voluntarily agreed to **Federally-Enforceable Conditions** proposed in the operating permit application, that reduce its potential emissions below Part 70 levels.

Installation:

All emission point\unit operations that belong to the same industrial grouping (the same first two(2)-digits of the SIC code) that are located on one (1) or more contiguous or adjacent properties and are under the control of the same person (or persons under common control). This definition includes any activities that result in fugitive emissions, and any marine vessels emissions while docked at the installation. (As defined in 10 CSR 10 6.020)

MCF: Thousand Cubic Feet

MMCF: Million Cubic Feet

MCF and MMCF are commonly used measures of natural gas consumption. The SCC (Source Classification Code) emission factors for natural gas are expressed in MMCF of gas burned, but some gas utilities' bills are expressed in terms of MCF. For emissions to be correctly calculated, the MCF term must first be converted to MMCF by dividing the MCF quantity by 1000.

Example: 16,972 MCF = 16,972 ÷ 1,000 MMCF = 16.972 MMCF.

Maximum Hourly Design Rate (MHDR):

Maximum Hourly Design Rate is the maximum throughput that could be processed in one hour of continuous operation by the equipment at this emission point. The throughput and MHDR must be expressed in the same Source Classification Code (SCC) units. If specific equipment information on the MHDR is not available, contact the Air Pollution Control Program for alternative methods to estimate the MHDR.

Example: Suppose the maximum capacity of a dump pit at a country elevator is 5,000 bushels an hour and wheat is the typical grain processed. Because the SCC units for grain receiving are in tons, the MHDR must be stated in terms of tons, not bushels.
5,000 bushels x 60 lbs/bushel ÷ 2,000 lbs/ton = 150 tons MHDR.

Molecular Weight:

The sum of the atomic weight of the constituent elements.

Example: The molecular weight of methane (CH_4) is 12+4(1) = 16 grams. This follows from the periodic table observation that the atomic weights of carbon and hydrogen are 12 and 1 grams, respectively.

NOx: Nitrogen Oxide Compounds, a criteria air pollutant.

Part 70 Installation:

A facility that meets either a source category or the emission criteria in 10 CSR 10-6.065(D). Part 70 installations are subject to all the Part 70 operating permit requirements found in Section (6) of 10 CSR 10-6.065. See Instructions under Section A for information on how to determine whether your facility is a Part 70 installation.

Plant #:

This is the second of a pair of four digit identification numbers assigned to all facilities in the APCP database. Each facility within a county has been assigned this unique identification number by the APCP. The lowest plant number will always be 0001 but the highest will be dependent upon the number of facilities in the county.

Particulate Matter less than ten microns (PM10):

Particulate Matter less than 10 microns in diameter, a criteria air pollutant. Examples are dust or smoke. If an emission factor is not listed for PM10, usually an emission factor can be calculated as ½ of the Total Suspended Particulate (TSP) emission factor.

Potential Emissions:

The emission rates of any pollutant at maximum design capacity. Annual potential shall be based on the maximum annual-rated capacity of the installation assuming continuous year-round operation. Federally enforceable permit conditions on the type of material combusted or processed, operating rates, hours of operation or the application of air pollution control equipment shall be used in determining the annual potential. Secondary emissions (emissions which occur or would occur as a result of the construction or operation of the installation or major modification but do not come from the installation or modification itself, do not count in determining annual potential.

Potential Emissions - Uncontrolled:

The amount of pollutants that could be emitted by a facility if all equipment is operated at the maximum hourly design rate for 24 hours per day, 7 days a week, 52 weeks per year (8,760 hours) removing the effect of any pollution control devices, such as a baghouse, being taken into account.

Potential Modifier:

This modifier reflects the reduction in the potential emissions resulting from an installation either being subject to an Federal\State Applicable Requirement\Regulation or by having established a "Federally Enforceable" permit condition to limit the potential emissions. The potential modifier is the percentage change due to the application of all of the appropriate potential limiting restrictions for a particular Emission Unit(s).

The modifier is expressed in terms of the decimal percentage of the remaining potential emissions. The modifier's value will always be greater than zero (0) and will never exceed a maximum of one (1). The Potential Modifier will equal one (1) if there are no potential limiting restrictions for the Emission Unit(s).

For example, an installation proposes a "Federally Enforceable Permit Condition" to limit the number of hours of operation from the normal 8760 hours to no more than 6,570 hours per year. This proposed condition would result in a **25%** (i.e. [1 - (6570 / 8760)] reduction in the potential emissions from every Emission Unit(s) in the installation. The value of the potential modifier would be entered as **0.75** for the purposes of calculating the new potential emissions from all the Emission Unit(s).

PSIA: Pounds per square inch

Release Flow Path

The Release Flow Path describes the route the emission takes from the emission unit to the emission release point. This path would include any control equipment that reduces the emission levels along the way. In MoEIS, release flow path is the mechanism used to document how emission units (such as boiler), control equipment (such as baghouse), and emission release points (such as stack) are connected.

Responsible Official:

Includes one (1) of the following:

A. The president, secretary, treasurer or vice-president of a corporation in charge of a principal business function, or any other person who performs similar policy and decision-making functions for the corporation, or a duly authorized representative of this person if the representative is responsible for the overall operation of one (1) or more manufacturing, production, or operating facilities applying for, or subject to, a permit and either:

(I) The facilities employ more than two hundred and fifty (250) persons or have a gross annual sales or expenditures exceeding twenty-five million dollars (in second quarter 1980 dollars); or

(II) The delegation of authority to his representative is approved in advance by the permitting authority.

B. A general partner in a partnership or the proprietor in a sole proprietorship.

C. Either a principal executive officer or a ranking elected official in a municipality, state, federal, or other public agency. For the purpose of this part, a principal executive officer of a federal agency includes the chief executive officer having responsibility for the operations of a principal geographic unit of the agency; or

D. The designated representative of an affected source insofar as actions, standards, requirements or prohibitions under Title IV of the Clean Air Act or the regulations promulgated under the Act are concerned and the designated representative for any purposes under Part 70. (10 CSR 10-6.020)

Reporting Level (Reporting Threshold):

If, after grouping similar processes in an installation, 200 lbs (0.1 ton) or more of criteria pollutants are emitted from a **point**, then all criteria pollutant emissions from that point must be reported. (HAP reporting levels are listed in the Form 2.T instructions).

Example 1: Suppose processes X, Y and Z are similar and have PM10 emissions of 100 lbs, 125 lbs, and 150 lbs, respectively. Since the processes are similar, the PM10 emissions must be totaled in order to determine whether or not these emissions must be reported. This total is 100 + 125 + 150 = 375 lbs and exceeds the 200 lbs (0.1ton) reporting threshold. Accordingly, processes X, Y, and Z will be reported under one point, say EP5, on Form 2.0. If there are other emission factors (such as VOC) listed with the SCC assigned to EP5, then emissions of these pollutants must also be reported, even though they do not exceed the 200 lb reporting threshold. The throughput listed on Form 2.0 would be the sum of the

throughputs for processes X, Y and Z.

Example 2: Suppose a process emits 100 lbs of VOC, 150 lbs of SO_x and 125 lbs of PM_{10}. Since the total of these emissions exceeds 200 lbs, these emissions must be reported.

Rounding Numbers:

This term involves approximating numerals. The reason for the approximation is to make the representation less complicated.

Example: Round 4.527 to two decimal places, i.e., approximate this number to the nearest hundreds. (Allow only two digits to the right of the decimal.) Since 7 is greater than or equal to 5, in rounding we "drop" the 7 and add 1 to the 2 (the hundreds position). Thus, 4.527 rounded = 4.53.

Example: Round 3.524 to the nearest hundreds. "Drop" the 4 since 4 is less than 5; do not add 1 to the 2; therefore, 3.524 rounded = 3.52

Rounding is different than truncation. In truncation, digits are "dropped" with no effect on digits to the left.

Example: Truncate to two decimal positions.
4.527 truncated = 4.52; 3.514 truncated = 3.51.

On previous EIQs, many did not round to the nearest hundreds but truncated instead. Please be sure to round, not truncate, the answers.

RVP 7: Diesel gasoline

RVP 10: Normal gasoline

RVP 13: Ethanol blended gasoline

Seg. No.: This is a two-digit number assigned by APCP used to uniquely identify processes associated with an emission point. Generally, if emission point EP01 has three processes associated with it, then Seg. No.s 01, 02 and 03 will be assigned to those processes. It is used as the Segment Number in the Environmental Protection Agency's Aerometric Information Retrieval System - Facility Subsystem database. Once assigned, this number should remain constant from year to year, even if the SCC used by the facility to identify a process changes.

SIC: Standard Industrial Classification. This is a designation system used by the federal government to identify industrial processes.

SCC: Source Classification Code. This is an eight digit number associated with a unique process from which air pollutants are emitted.

Example: A solvent-based paint applied in a paint booth could have an SCC of 4-02-001-01 or 4-02-001-02. Which of the two is appropriate would depend on the throughput units chosen. The throughput units for 4-02-001-01 are in tons of coating mix applied. Throughput units for 4-02-001-02 are in gallons of coating mix applied.

SCC Units: The measure by which annual throughput is denoted; examples are tons, gallons, million cubic feet, vehicle miles traveled, etc.

SOx: Sulfur Oxide Compounds, a criteria air pollutant.

Total Potential Emissions:

The emissions resulting if the facility operated at maximum capacity twenty-four (24) hours per day, seven (7) days per week, fifty-two (52) weeks per year.

In the operating permit application, your facility's **total potential emissions** are the annual **potential emissions** that would be possible when the facility is in compliance with **federally-enforceable conditions** that are currently in place. The voluntary conditions proposed in the operating permit should be included in the calculation of **total potential emissions**.

Toxic Air Pollutant:

For the purposes of the operating permit application, toxic and **hazardous air pollutant (HAP)** are interchangeable terms.

True Vapor Pressure:

The equilibrium partial pressure exerted by a volatile organic liquid, as defined by ASTM-D 2879 or as obtained from standard reference texts.

TSP: Total Suspended Particulate. This is no longer reportable as a criteria pollutant.

Vapor Pressure:

When liquids evaporate, gas vapor forms at the surface of the liquid and escapes. In a closed container, the vapor accumulates and creates pressure called vapor pressure. Each liquid exerts its own vapor pressure at a given temperature. As temperature increases, more vapor forms and vapor pressure increases.

VMT: Vehicle Miles Traveled

VOC: volatile organic compounds, a criteria air pollutant

Working Loss:

Evaporative loss occurring as a result of the filling and the withdrawal of liquid to and from a storage tank. Also called *withdrawal loss.*

INSTRUCTIONS

FORM 1.0 GENERAL PLANT INFORMATION

This is a **REQUIRED** form for all facilities.

Facility Name: Enter the official company name and/or plant designation for the facility that is submitting this Emissions Inventory Questionnaire (EIQ) if not already preprinted. This name will usually be the same as on the mailing label. If your official company name has changed in the calendar year of record, please enter the new name in the box. This official facility name must be entered on every form submitted.

Facility Street Address, City and ZIP Code: The street address is the physical location of the facility.

Facility Mailing Address, City and ZIP Code: The mailing address should be entered if the mailing address of the facility is different from the street address.

Facility Contact Person: The facility contact is the person most familiar with the operations of the plant and who should answer any questions regarding information about the facility. Also, list the title of the contact person.

FIPS County Number, County No., Plant No., Year of Data, Region, and Classification: This information may be preprinted on the form. If any of the boxes are blank, fill in any of the known information. See "List of Missouri Counties" in this instruction packet for appropriate FIPS (3 digit), county (old 4 digit) codes and Department of Natural Resources regions. Year of Data is the calendar year of record. If you do not know your plant number or classification, leave blank. Air Pollution Control personnel will assign. The FIPS County Number, Plant Number and Year of Data must be entered on every form and any documentation submitted.

Facility Phone Number: The facility phone number is the telephone number where the contact person can be reached.

Product/Principal Activity: Enter the general product manufactured, the material handled by your facility or the principal activity performed at this location.

Number of Employees: Enter the total number of full-time and the equivalent number of part-time employees. Two part-time workers employed 20 hours per week are equivalent to one full-time worker.

Land in Acres: Enter the number of acres at the plant location and any surrounding land that the same facility also owns.

Where to send EIQ in Future: Check appropriate box.

Geographical Coordinates: The geographical coordinates field is required and must be entered in either the Universal Transverse Mercator (UTM) coordinate system or with latitude and longitude coordinates.

CSTR Legal Description: United States Public Land Survey – The system of partitioning land into parcels, also called township and range. On lands where CSTR is applicable, this information is found in the legal description (abstracts, deeds, etc.) of the land. An example of this description:

The northwest quarter of the northeast quarter of section 3 of township 8 north, range 1 west, etc. is written on Form 1.0 as follows:

CSTR Legal Description				
(1/4):	(1/4):	Section	Township	Range
NW	NE	3	8N	1W

The County/Township/Section/Range field must be completed except those facilities that report to a local agency.

Resources for obtaining coordinates:

1. Global Positioning Units
2. Utilizing local resources available to the company such as enhanced 911 systems, planning and zoning offices, county clerk's offices, etc. that are now becoming involved in assigning locator information to companies.
3. Utility Companies
4. Map Interpolation
5. Address Geocoding
6. Architectural Plans (Surveys)

Parent Company Information: Complete this block if your company is owned totally or in part by another company at a different location.

Total Plant Emissions: After the actual air emissions are totaled for each pollutant in Block 2 on Form 3.0, Emissions Fee Calculation, transfer the appropriate figures **(2 decimal places)** for each pollutant to this block.

Certification: The last two lines on the page are to be completed by the person completing the form and by an authorized company representative. Include their titles in the blocks also. **Both signature blocks must be signed**; unsigned EIQs will **NOT** be accepted.

Check Amount, Check Number, Check Date: Fill in your company's check information.

NOTE: Requests for EIQ confidentiality must be submitted annually in letter format, signed by an authorized company representative.

INSTRUCTIONS
FORM 1.1 PROCESS FLOW DIAGRAM

This is a **REQUIRED** form for all facilities. A separate sheet of paper may be used as a substitute for this process flow diagram form. If a substitute sheet is used, please do not return blank copies of Form 1.1. The following directions apply to both Form 1.1 and substitute sheets:

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**

A process flow diagram identifies all processes at a facility. A process is a specific function or procedure occurring within the facility that transforms, transports or consumes any solid, liquid or gaseous material; this includes all operations involving manufacturing, material loading/unloading, fuel combustion and any cleanup of equipment or materials. A process flow diagram should describe the interrelationships of all the operations mentioned above. The diagram should also show all emission points and air pollution control devices.

An emission point is any specific point or area where any air pollutant is released from a process or operation into the ambient air, or the process where the emissions are generated. See the glossary definitions for a discussion of these two viewpoints.

An air pollution control device is any equipment or other method used to control, remove or reduce the amount of a specific air pollutant before that pollutant is released into the ambient air.

Please construct or provide a clear and concise drawing that describes all processes and emission points within your facility. The facility may provide any existing map(s) or diagram(s) in place of the process flow diagram if it lists and labels all the processes and emission points within the facility and clearly indicates process flow. Whichever option you choose, label the diagram as follows:

A. Identify each process with an appropriate label that is descriptive of that operation and/or the equipment used in that process.

B. Identify with an appropriate identification number all emission points from which any air pollutant is emitted from a process. If an existing identification system for the facility is not already in place, number all emission points sequentially, beginning with emission point number EP01.

C. Identify each air pollution control device with an identification number and an appropriate label descriptive of the control device(s) being used with a process. If an existing identification system for the facility is not already in place, control devices should be numbered sequentially, beginning with device CD01.

The same identification numbers that are used in the process flow diagram must be used consistently throughout the rest of the EIQ. **The same identification numbers should also be used consistently from year to year.** DO NOT RENUMBER emission points if you add or delete a process. A point may be deleted only if the process equipment has been dismantled.

INSTRUCTIONS
FORM 1.2 SUMMARY OF EMISSION POINTS

This is a **REQUIRED** form for all facilities.

All emission points shown on Form 1.1, Process Flow Diagram, must be listed on this page.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**

1) **Total Number of Emission Points:**

Enter the total number of emission points shown on Form 1.1, Process Flow Diagram.

2) **Point Number:**

The identification number must be the same as the identification number assigned to this point on all other EIQ forms.

3) **Point Description:**

Provide a brief description that uniquely describes this emission point. This should be the same as the point description entered on Form 2.0.

4) **Worksheet(s) Used with Form 2.0:**

At least one Form 2.0 must be completed for each emission point. Please list any other worksheets (Form 2.1 through Form 2.T) used to provide additional information or perform a calculation for this emission point. Only the worksheet number(s) should be entered in this block.

INSTRUCTIONS
FORM 2.0 EMISSION POINT INFORMATION

This form is **REQUIRED** of all facilities.

This form must be completed for each reportable emission point (200 lbs. or more of criteria pollutants per point) shown on Form 1.1, Process Flow Diagram, and Form 1.2, Summary of Emission Points (see definition in Glossary of Reporting Level). A separate Form 2.0 must be completed for each fuel type used (or capable to use) for each emission point even if **no annual throughput.**

The authorized facility representative signing the EIQ is responsible for ensuring all submitted EIQ forms are filled out completely. Incomplete forms will be returned and the program will note that a complete submittal was not received. Items that clearly do not apply may be left blank, but all others must be filled in. Required items include, but are not limited to, SCC codes, throughput values, maximum hourly design rates, emission factors, source and reference for emission factors and actual emissions. All units must be consistent.

Complete **Facility Name, County Number, Plant Number** and **Year of Data.**

1) POINT IDENTIFICATION

Point Number: This identification number must match the emission point identification number listed on Forms 1.1 and 1.2. The same point number must be used on any other form(s) associated with this emission point.

AIRS ID - Pt.: This is a three-character emission point identifier assigned by APCP staff. It is used as the Point Number in the Environmental Protection Agency's Aerometric Information Retrieval System - Facility Subsystem database. Once this number is assigned to an emission point, it should remain constant from year to year, even if the Point ID supplied by the facility is changed.

Standard Industrial Classification (SIC) Code: The federal government uses this code. Enter the industry code specific to this emission point description.

Point Description: This description must uniquely identify the process associated with this emission point.

Source Classification Code (SCC): This code identifies the type of combustion or processes associated with an emission point. SCCs specific to your facility are contained in AP-42 (U.S. Environmental Protection Agency (EPA) *Compilation of Air Pollution Emission Factors)* or FIRE (Factor Information and Retrieval System). **This is a required field.** If you cannot locate a SCC specific for your process, use a SCC most closely associated to your process.

Emission Factor Unit: SCC emission factor units, Annual Throughput units, and Maximum Hourly Design Rate (MHDR) units must be the same and must correspond to the SCC Emission Factor Unit. For example, if the SCC units are in 1000 gallons, then the Annual Throughput and MHDR must also be in 1000 gallons.

Number of SCCs Used with this Point: Specify the number of SCCs used with this emission point. This number will be the same as the number of copies of Form 2.0 having the same point number. An example of an emission point with multiple SCCs is a boiler burning two different types of fuel. Each fuel type would require a different SCC and a separate Form 2.0 for each fuel used.

Seg. No.: This is a two-digit number assigned by APCP used uniquely to identify processes associated with an emission point. Generally, if emission point EP01 has three processes associated with it, then Seg. No.'s 01, 02 and 03 will be assigned to those processes. The Segment Number is used in the Environmental Protection Agency's Aerometric Information Retrieval System - Facility Subsystem database. Once this number is assigned to a process, it should remain constant from year to year, even if the SCC changes.

SCC Description: Source Classification Code is an eight-digit number associated with a unique process from which air pollutants are emitted. Example: An industrial space heater that uses natural gas as a fuel has an SCC number of 1-05-001-06.

2) STACK/VENT PARAMETERS

This section should be left blank for emission points that do not vent through a stack. Height and diameter must be provided when completing this section.

Stack Number: This identification number should be your stack, vent or other identification number that uniquely identifies the stack.

AIRS ID - St.: This is a three-digit stack identifier supplied by APCP staff. It is used as the Stack Number in the Environmental Protection Agency's Aerometric Information Retrieval System - Facility Subsystem database. Once this number is assigned to a stack, it should remain constant from year to year, even if the stack number supplied by the facility changes.

Height (Stack Feet): This is the vertical distance between ground level and the point of exhaust into the ambient air.

Diameter (Feet): This is the inside diameter of the top of a circular stack exit. For a non-circular stack exit, use an equivalent diameter calculated from the cross-sectional area. This equivalent diameter, d, equals the product of the square root of 1.128 and A. That is, $d = (1.128 \times A)^{1/2}$, where A is the cross-sectional area in square feet. The carat symbol, ^, indicates that ½ is an exponent.

Temperature (F): This is the exhaust temperature in degrees Fahrenheit for this stack. If the exhaust is discharged at ambient temperatures, enter 77 degrees F.

Velocity (Feet/Minute): This is the exhaust gas velocity from the stack expressed in feet per minute. This figure can be calculated from the flow rate by dividing the actual cubic feet per minute of flow rate by the cross-sectional area of the stack.

Flow Rate (Cubic Feet/Minute): This is the exhaust gas volume from the stack at the actual operating temperature. Flowrates can be obtained from manufacturers' fan output information in some cases (rated flowrate on the equipment). If a stack exit velocity is known through a test, then the stack cross-sectional area can be multiplied by the velocity to get the flowrate.

List other Points Sharing this Stack: Provide a list of the emission points vented through this stack.

3) AIR POLLUTION CONTROL EQUIPMENT

If there are more than two control devices operative at an emission point, use Form 2.0C, Control Device Information, to describe the additional devices.

Device Number: This is the number you select uniquely to identify the air pollution control device. This device number should be the same as that shown on Form 1.1, Process Flow Diagram, for this equipment.

Device Code: This three-digit control device code is found in the Control Device Listing included with this instruction packet. Use the code that best describes the control equipment.

Description of Control Device: Describe the control equipment used to reduce or remove air contaminants. The type of equipment (Example: cyclone, baghouse, etc.) is most important, but brand and model numbers are also appropriate.

Capture Efficiency (%): This is the amount of material taken in by the control device. Capture efficiency will be applicable to emission points controlled by air pollution control devices and are not fully enclosed. Capture efficiency is not applicable to emission processes with water suppressant or water spray controls, such as haul roads.

Guidelines for Determining Capture Efficiency of a Control Device at an Emission Point.

Capture efficiency is determined at each emission point controlled by a control device, regardless of the location of the control device. If a facility has a single central control device, and that device takes in pollutants from multiple emission points, a capture efficiency must be determined for each point. Please use the following hierarchy to determine capture efficiency. The APCP reserves the right to require a facility to change its reported capture efficiency.

1) Testing: Testing is the best method of determining capture efficiency. This testing could have been done when the control device was installed, or afterwards. If this method is used to determine capture efficiency, the documentation verifying the capture efficiency needs to be supplied with the EIQ. If new testing is done, the APCP needs to contacted, so that the proper procedures can be followed.

2) Engineering Calculations/Drawings: If control device testing has not been done, then engineering calculations, drawings or estimations can be supplied with the EIQ to determine the capture efficiency at an emission point.

3) EPA Documents: EPA documents can be used by a facility if the above two methods are not possible. Examples of acceptable EPA documents are the AP-42, AP-42 Background Documents, and Control Technique Guidelines. These documents need to be cited in the EIQ as the source of the capture efficiency determination.

4) Default 50% Capture Efficiency: If both testing and engineering calculations are not possible, and EPA documents are not available, then a default 50% capture efficiency may be used. Documentation will need to be provided stating why the capture efficiency at the emission point was not able to be determined.

Control Device Efficiency (%): The control efficiency entered must be within the acceptable range for this control device. Refer to or must match the control device efficiency % in construction and/or operating permit.

4) OPERATING RATE/SCHEDULE

Annual Throughput: This is the amount of material used, processed or produced in the process associated with the emission point during the calendar year.

Annual Throughput Units: SCC emission factor units, Annual Throughput units, and Maximum Hourly Design Rate (MHDR) units must be the same. For example, if the SCC units and Annual Throughput units are in 1000 gallons, the MHDR must also be in 1000 gallons.

Maximum Hourly Design Rate: This entry is the maximum hourly operating rate possible for the equipment associated with the emission point. To calculate the rate for combustion-related equipment, follow the applicable instructions on Form 2.1, Fuel Combustion Worksheet.

Maximum Hourly Design Rate Units: SCC emission factor units, Annual Throughput units, and Maximum Hourly Design Rate (MHDR) units must be the same and must correspond to the SCC Emission Factor Unit. For example, if the SCC units are in 1000 gallons, then the Annual Throughput and MHDR must also be in 1000 gallons.

Hours/Day: This figure is the normal number of hours per day that the equipment or process associated with the emission point was in operation.

Days/Week: This figure is the normal number of days per week that the equipment or process associated with the emission point was in operation.

Weeks/Year: This figure is the normal number of weeks per year that the equipment or process associated with the emission point was in operation.

Jan-Mar(%), Apr-Jun(%), Jul-Sep(%), and Oct-Dec(%): For each of the four calendar quarters, specify the percentage of total Annual Throughput attributable to each quarter. Estimates are acceptable. The entries for all four quarters must total 100%.

EMISSIONS CALCULATIONS

5) List other Worksheets (used with this Form): List all worksheets (Form 2.1 - Form 2.T) associated with this Form 2.0.

6) Source of Emission Factor: Indicate the number code of the source of the emission factor for each pollutant emitted at a point. Use the following hierarchy in determining what to use as the source of the emission factor. If information for a source is not available, then the next source on the hierarchy may be used in its place. The Air Pollution Control Program reserves the right to require a facility to use a specific source.

1) Continuous Emission Monitoring (CEMS);
2) Stack Testing;
3) Material/Mass Balance;

If "**4**" (AP42) or "**5**" (Other) is selected, the **AP42/Other Reference** block **MUST** be completed. List the section, table, figure number, title, etc. that identifies the emission factor source.

4) AP-42 (Environmental Protection Agency (EPA) *Compilation of Air Pollution Emission Factors)* or FIRE (Factor Information and Retrieval System);
5) Other EPA approved documents;
6) Sound engineering calculations (must include documentation);
7) Worksheet Number; for example, 2.7 means Haul Road Worksheets was used.

7) **Emission Factor (Pounds/Unit):** This figure is the factor that must be provided for each pollutant released at the emission point described. If Continuous Emission Monitoring, Stack Test, or Mass Balance was used as the emission source, then supporting documentation **MUST** be supplied to verify the emission factor.

8) **Ash or Sulfur %:** This entry is REQUIRED ONLY IF there is an Ash or Sulfur Flag (A or S) accompanying the SCC for this process. If applicable, enter the Ash or Sulfur Content of a fuel used in a combustion process. This content is usually expressed as a percentage of the fuel by weight. If the same fuel type but with different Ash and/or Sulfur Contents was used in the same combustion process during a calendar year, then a weighted average of the ash or sulfur percentage must be calculated using Form 2.1, Fuel Combustion Worksheet. Ash and sulfur percentages should be available from your fuel supplier. When calculating emissions, be sure to use the ash/sulfur percent; **do not convert to the decimal equivalent.** (See example calculation under Section 10, Method 2.) The shaded boxes in Block 8 on Form 2.0 do not need to be completed.

9) **Overall Control Efficiency (%):** An overall control efficiency for each class of pollutant will be determined using the following formula:

Overall Control Efficiency for x = (CP x CE_x) ÷ 100

Where x = a class of pollutant (PM_{10}, SO_x, NO_x, VOC, CO, Lead, or HAP)
CP = Capture Efficiency of the Control Device
CE_x = Control Efficiency for that Class of Pollutants

Example: A control device has a Capture Efficiency of 50%, and destroys 75% of the VOCs it captures.

CP = 50%
CE_{VOC} = 75%
Overall Control Efficiency for VOCs = (50 x 75) ÷ 100
= 3750 ÷ 100
= 37.5 %

A pollutant should have an overall control efficiency **ONLY** if there is a control device in block 3 of Form 2.0 (or on Form 2.0C) that controls that particular class of pollutants.

Multiple Control Devices

If more than one control device applies to the same pollutant at an emission point, the combined overall control efficiency needs to be calculated. This can be done several different ways, depending on the configuration of the control devices.

A) If each control device has its own separate intake, then each control device will use its own capture efficiency.

B) If the control devices are in series, the capture efficiency of the first device in the series is used to determine the overall control efficiency for the entire series. The following formula can be used to determine overall control efficiencies for devices in series.

$$\text{Combined Control Efficiency} = \{CE_1 + CE_2 - [(CE_1 \times CE_2) \div 100]\} \times CP_1/100$$

where CE_1 = Control Efficiency for First Device in the Series
CE_2 = Control Efficiency for Second Device in the Series
CP_1 = Capture Efficiency for First Device in the Series

Example: When two devices in series are used to remove the pollutant PM10 from the same emission point, the control efficiencies must be combined. For example, if the first device has a capture efficiency of 75% and a control efficiency of 50% for PM10 and the second device has an efficiency of 80% for PM10, the calculation of combined efficiency is as follows:

Combined Control Efficiency = {50 + 80 - [(50 x 80) ÷ 100]} x (75 ÷ 100)
= {130 - [4000 ÷ 100]} x .75
= {130 - [40]} x .75
= 90 x .75
= 67.5%

Thus, the combined control efficiency for PM10 at this emission point would be 67.5%

C) If control devices are in a configuration other than the two listed above, you may provide documentation for your facilities control devices. This documentation should show your calculations for the overall control efficiency for each class of pollutant at this point. If you have any questions call the Missouri Air Pollution Control Program at (573) 751-4817.

10) **Actual Emissions (Tons/Year):** This is the amount in tons per year of the pollutant emitted at the emission point described. All figures should be rounded to two decimal places. There are two possible formulas.

Method 1: If the Ash or Sulfur Percent is not given, use the following formula:

Actual Emissions = Annual Throughput x Emission Factor
x [(100 - Overall Control Efficiency) ÷ 100] ÷ 2000.

Example: Assume the Annual Throughput is 30,000 tons of grain processed, the PM10 emission factor is .91 pounds of PM10 emitted per ton of grain processed and a PM10 control device for this emission point has an efficiency of 90%. Using the formula above:

Actual Emissions = 30,000 x .91 x [(100 - 90) ÷ 100] ÷ 2000
= 27,300 x [10 ÷ 100] ÷ 2000
= 27,300 x [.1] ÷ 2000
= 2,730 ÷ 2000
= 1.365 tons of PM_{10} emitted per year

Enter 1.37 in the PM10 box in Block 10, Actual Emissions, on Form 2.0.

Note: If no control devices were used, the Control Efficiency equals 0% and the annual PM10 emissions would be 13.65 tons.

Method 2: If the Ash or Sulfur Percent is greater than 0, the following formula must be used:

Actual Emissions = Annual Throughput x Emission Factor x Ash/Sulfur %
x [(100 - Percent Control Efficiency) ÷ 100] ÷ 2000.

Example: Assume the Annual Throughput is 10,000 tons of fuel burned, the SO_x emission factor is 30 pounds of SO_x emitted per ton of fuel burned, the Sulfur Content of the fuel is 1.7% and the SO_x control device has an efficiency of 50%. Using the previous formula:

Actual Emissions = 10,000 x 30 x 1.7 x [(100 - 50) ÷ 100] ÷ 2000
= 300,000 x 1.7 x [50 ÷ 100] ÷ 2000
= 300,000 x 1.7 x [.5] ÷ 2000
= 510,000 x [.5] ÷ 2000
= 255,000 ÷ 2000
= 127.50 tons of SO_x emitted per year

You would enter 127.50 tons in the SO_x box in Block 10, Actual Emissions, on Form 2.0.

THE REST OF THE INSTRUCTIONS ARE FOR INFORMATIONAL PURPOSES ONLY. YOU ARE NOT REQUIRED TO COMPLETE ANY PORTION OF THE SHADED BLOCKS FOR THE EMISSIONS INVENTORY.

YOU ARE NOT REQUIRED TO COMPLETE ANY PORTION OF THE SHADED BLOCKS at the lower right-hand corner of Form 2.0. These blocks are intended for state or local air pollution control agency use in calculating potential emissions. However, if you wish to calculate the potential at your facility, the applicable definitions and formulas are as follows:

Potential Emissions are those emissions that would result if a facility operated at 100% of its rated capacity for 24 hours per day on a year-round basis.

Maximum Hourly (Lbs/Hr) =

Maximum Hourly Design Rate x Emission Factor

Potential Controlled includes the effect of ALL applicable air pollution control measures.

Potential Controlled Emissions -- Annual (Tons /Yr) =

Maximum Hourly Design Rate x Emission Factor x Ash/Sulfur % x 8760 hours/year x [(100 - Overall Control Efficiency) ÷ 100] ÷ 2000 lb/ton

Potential Uncontrolled does NOT INCLUDE the effect of any air pollution control measures.

Potential Uncontrolled Emissions -- Annual (Tons/Yr) =

Maximum Hourly Design Rate x Emission Factor x Ash/Sulfur % x 8760 hours/year ÷ 2000 lb/ton

NOTE: The above potential calculations do not allow for any federally-enforceable permit conditions.

INSTRUCTIONS

FORM 3.0 EMISSIONS FEE CALCULATION

This form is **REQUIRED** for all facilities. All facilities within the jurisdiction of the Kansas City Health Department use Form 3.0KC, or the St. Louis County Department of Health use Form 3.0STLC. All Charcoal Kilns use Form 3.0CK.

Use the top portion of Form 3.0 to list and total the amount of air pollutant emissions from each emission point shown on Form 1.1 Process Flow Diagram, and Form 1.2 Summary of Emission Points. Enter the amount of each air pollutant emitted from the emission figures calculated on Form 2.0 Emission Point Information. Use the lower portion of Form 3.0 to calculate the emissions fee. Fill out the lower portion ONLY ONCE, using the total amount of each pollutant released for the entire facility.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**

1) POINT NUMBER/SCC

Enter in the first column the same Point Number and Source Classification Code (SCC) used for the Point Number and SCC on Form 2.0, Emission Point Information. Copy the calculated Actual Emissions figure for each pollutant from Block 10 of Form 2.0 to the appropriate pollutant box of Block 1; i.e., particulate matter less than ten microns (PM_{10}) Actual Emissions to the box for PM_{10}. Use each row of Block 1 to list the Actual Emissions for only one Form 2.0. The Actual Emission figures should be expressed in **tons per year** and the figures **rounded to two (2) decimal points.**

Use the last row of the upper portion of Form 3.0 to calculate a **Page Total** of emissions for each pollutant. Calculate the Page Total for a pollutant by summing the Actual Emissions for each emission point for that pollutant. If the facility has more than ten emission points, additional copies of Form 3.0 will be needed to list them all. If more than one page is used, make sure to enter the previous Page Total for each pollutant on the first row of each additional page. Using the **first row to list the previous Page Totals** will ensure that the final Page Total figures are the total emissions for each pollutant for the entire facility.

> ***NOTE:*** FILL OUT THE LOWER PORTION OF FORM 3.0, EMISSIONS FEE CALCULATION ONLY **ONCE,** USING THE TOTAL ACTUAL EMISSIONS FOR EACH POLLUTANT FOR THE ENTIRE FACILITY.

2) ACTUAL EMISSIONS

Enter the total actual emission figures for each pollutant for the entire facility. These pollutant emission figures should be the numbers that are on the Page Total row for the last copy of Form 3.0. Sum the emissions for all of the pollutants and enter the number in the TOTALS box.

ENTER THE ACTUAL EMISSION FIGURE FOR EACH POLLUTANT FROM BOX 2 INTO THE APPROPRIATE BOX OF THE EMISSIONS STATEMENT ON FORM 1.0, GENERAL PLANT INFORMATION.

3) CHARGEABLE EMISSIONS

There is a 4,000 ton per year emissions cap for any single air pollutant that one facility emits. This cap is the maximum emission for any single air pollutant for which a facility is required to pay an emissions fee. Check to determine if the Actual Emission Figures for any pollutant in Block 2 is greater than 4,000 tons per year.

If the Actual Emissions for a pollutant are more than 4,000 tons per year, enter 4,000 in that pollutant's box in Block 3. If the Actual Emissions are 4,000 tons per year or less, copy the same actual pollutant emission figures from Block 2 to Block 3.

No state Emissions Fee will be charged for Carbon Monoxide (CO).

4) SUM OF CHARGEABLE EMISSIONS SUBJECT TO FEES

Sum the Chargeable Emissions figures for all the pollutants except CO and enter the number in Box 4.

There is a 12,000 ton per year emissions cap for all pollutants emitted from one facility. This cap is the maximum emissions amount for all air pollutants for which a facility is required to pay emissions fees. If the sum of the Actual Emissions is more than 12,000 tons per year, enter 12,000 in Block 4. If the Actual Emissions are 12,000 tons or less per year, enter the Chargeable Emissions figure in Block 4.

Round the number entered in Block 4 **to the nearest ton** of emissions per year. See examples of rounding in the Glossary under "Rounding Numbers." If chargeable emissions are **less than one (1) ton, the source shall pay a fee equal to the amount of one (1) ton** in accordance with 10 CSR 10-6.0110.

5) TOTAL ANNUAL EMISSIONS FEE

Multiply the Sum of Chargeable Emissions calculated in Block 4 by **$31.00** and enter this amount in Block 5.

6) Copy the Actual Emission figures for each pollutant in Box 2 to the appropriate box of the Emissions Statement on Form 1.0, General Plant Information, if you have not already entered it.

Include a **check** for the Total Chargeable Annual Emissions Fee amount calculated in Block 5 payable to the:

MISSOURI AIR POLLUTION CONTROL PROGRAM
and mail to the:
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176, 205 Jefferson Street
Jefferson City, Missouri 65102

Please include your FIPS county-plant number on your check or letter, especially if you mail your check separately from your EIQ. This will ensure that your check is posted to the right facility.

Facilities within **LOCAL** Air Pollution Control Agencies' jurisdiction should mail complete EIQ to local agency and only include copies of the following forms **with their check** to the state:

Form 1.0, General Plant Information;
Form 3.0, Emissions Fee Calculation;
Form 4.0, Financial Cost Estimate.

(***NOTE:*** If applicable, the address at the top of Form 1.0 will be the local agency address.)

Facilities within the **STATE's** jurisdiction should send the entire original EIQ and their check to the state (Jefferson City address).

7) Send the completed EIQ and any supporting documentation to the **address** of the Air Pollution Control Agency shown on the **top of Form 1.0**, General Plant Information.

Please be sure to include a date, county-plant number, point identification, and SCC number on any letters of explanation or supporting documentation.

INSTRUCTIONS

FORM 4.0 FINANCIAL COST ESTIMATE

This form is **REQUIRED** for all facilities.

The Missouri Air Law, Chapter 643 requires a financial cost estimate. The cost estimate is an evaluation of any additional cost of doing business (during the current year reporting) attributable to the federal Clean Air Act, as amended.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**
See Form 1.0 instructions, page 1.0-1.

1) Calculate the cost incurred to complete the Emissions Inventory Questionnaire (EIQ), including the job titles of the persons reviewing and completing the forms, the number of hours, the cost per hour and the final total amount. Please use the code from the 'A-list' for each personnel this applies to.

2) If an outside Engineering Consultant reviewed or completed part or all of the EIQ, list the job titles of the persons reviewing and completing the forms, the number of hours, the cost per hour and the final total amount. Please use the code from the 'A-list' for each personnel this applies to.

3) If during the current year reporting, you purchased any new air pollution control devices or had to do additional monitoring or testing during the year because of Clean Air Act requirements, include the cost. **Please list these costs separately.** Please use a code from the 'B, C, D, or E-list' for each piece of equipment or person this applies to.

4) If you hired additional employees to implement the provisions of the Clean Air Act, list their job titles, the cost per hour and the final total amount. Please use a code for each personnel this applies to.

5) Calculate the cost of personnel; such as, salaries, benefits, and training required by the Act. Also, list other costs for complying with the Clean Air Act. Examples of these costs would be Operating Permit fees, Title I fee, and compliance with Acid Rain Provisions. Please use a code for the equipment or personnel this applies to. Please list these costs separately. Do not include emission fees as expense since that amount is included on Form 3.0.

Total all the columns as appropriate.

If you have further information or comments regarding the above categories or any general comments, please include them under remarks on Form 4.0.

Return a copy of this form to:

Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176, 205 Jefferson Street
Jefferson City, MO 65102

CODE LISTS FOR FORM 4.0

Use these codes for form 4.0.
Personnel codes are applicable to blocks 1, 2, and 5.
The other codes are applicable for block 3 and 5.

PERSONNEL

A01	Accountant / Bookkeeper
A02	Administrative Assistant / Secretary
A03	Consultant (Engineering, Environmental, and Safety)
A04	Coordinator (Compliance, Environmental, Facility, Permit and Safety)
A05	Director
A06	Data Assistant / Data Processor
A07	Draftsman / CAD Operator
A08	Engineer - Environmental/Air Quality
A09	Engineer - Professional (not Environmental)
A10	Engineer - Other
A11	Environmental Chemist/Scientist
A12	Environmental Assistant
A13	Floor Employee / Operator
A14	Geologist
A15	Industrial Hygienist
A16	Investigator, Senior
A17	Manager / Supervisor
A18	Metallurgist
A19	MIS Programmer
A20	Owner / Co-owner
A21	President / Vice President / CEO
A22	Production Planner
A23	Regulatory Leader
A24	Scientist (Air Quality and Environmental)
A25	Senior Field Specialist
A26	Specialist
A27	Superintendent
A28	Systems Administrator / Operator
A29	Technician
AXX	Other (Please put job title on Form 4.0)

AIR POLLUTION CONTROL EQUIPMENT

B01	Ash Removal System
B02	Chromium Plating Emissions Control Device
B03	Control Equipment
B04	Dust Collectors
B05	Dust Sprayers
B06	Filters
B07	Maintenance of Control Equipment

(Codes are continued on back)

AIR POLLUTION CONTROL EQUIPMENT (cont'd)

B08	Mill Steam Inerting
B09	Nitrogen Oxides Burners
B10	Rack With Emission Controls
B11	Scrubber
B12	Suppressants
B13	Thermal Oxidizer
B14	Vapor Condenser
B15	Water Trucks
BXX	OTHER : (please put on Form 4.0)

CONTROL EQUIPMENT LABOR COSTS

C01	Engineering Support And Consultants
C02	Environmental Technicians
C03	Maintenance Personnel
C04	Supervisory Personnel
C05	Water Truck Drivers
C06	Other Control Device Operators
CXX	OTHER : (please put on Form 4.0)

TESTING AND MONITORING

D01	CEM Capital Costs
D02	CEM Operations and Maintenance
D03	CEM Testing
D04	Continuous Emissions Monitor (CEM)
D05	Contract Labor
D06	Data Reporting
D07	Leak Detection and Repair
D08	Testing
D09	Vapor Combustion Performance Test
DXX	OTHER : (please put on Form 4.0)

VARIOUS PERSONNEL AND OTHER COSTS

E01	CAD Draftsman
E02	Electricity
E03	Calculating of Emission Fees
E04	Nonspecific Costs
E05	Permit Fees
E06	Software Maintenance Contract
E07	Taxes
E08	Training and Meeting Expenses
EXX	OTHER : (please put on Form 4.0)

ENVIRONMENTAL PROTECTION AGENCY
EMISSION FACTOR AND INVENTORY GROUP (MD-14)
RESEARCH TRIANGLE PARK, NC 27711

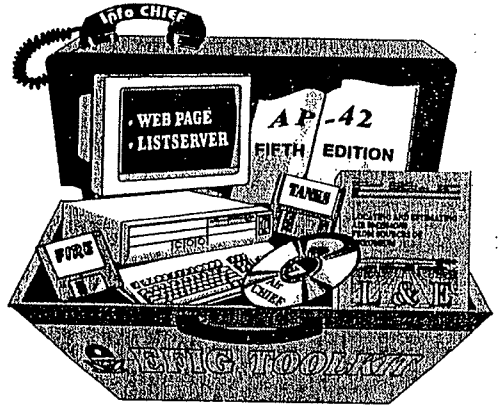
United States Environmental Protection Agency
EPA-454/F-99-008
October 1999

Office Of Air Quality Planning And Standards
Research Triangle Park, NC 27711

EPA

TOOLS

FOR ESTIMATING CRITERIA AND TOXIC AIR POLLUTANTS



Emission Factor and Inventory Group
Emissions, Monitoring, and Analysis Division
Office Of Air Quality Planning and Standards
U. S. Environmental Protection Agency

Emissions Estimation Tools

This brochure provides an overview of the U. S. Environmental Protection Agency's (EPA) air toxics and criteria emission estimating tools. EPA develops air emission inventory tools for point and area sources to support many activities, including: Clean Air Act requirements, State Implementation Plans (SIP), SARA 313 reporting requirements, and other emission estimating and assessment activities. Most of these tools are developed and maintained by the Emission Factor and Inventory Group (EFIG) within EPA's Office of Air Quality Planning and Standards (OAQPS).

This brochure describes each tool and its intended use. Users should select the tool(s) best suited to their projects and obtain the reports or computer databases necessary. For further information on any of these tools, call ***Info CHIEF*** at (919) 541-5285, or write:

Info CHIEF
U. S. Environmental Protection Agency
Emission Factor and Inventory Group
(MD-14)
Research Triangle Park, NC 27711
(E-mail: info.chief@epamail.epa.gov)

These estimating tools should be used with discretion. Actual emissions from individual sources may vary considerably from values estimated by using emission and speciation factors. Source-specific emission test data are generally preferred when available. EFIG welcomes any emission data that would help improve the emissions estimating tools presented in this brochure.

To Order Tools

Copies of the tools mentioned in this brochure are available from different sources and under differing conditions related to requester status (government agency, commercial entity, nonprofit organization, Freedom of Information Act requestor, etc.).

Tools with stock numbers (for example, 055-000-00501-0) are available for a fee from the Government Printing Office (GPO), Superintendent of Documents, P. O. Box 371954, Pittsburgh, PA 15250-7954. Call (202) 512-1800 to order.

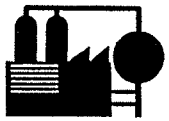
Tools with order numbers (for example, PB94-500584) are available for a fee from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161. Call (703) 487-4650 to order.

To learn more about any items mentioned here, especially about their use, contact the ***Info CHIEF*** Help Desk, (919) 541-5285 or visit our website at **http://www.epa.gov/ttn/chief/**.

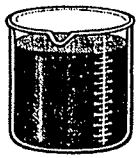
COMPUTER TOOLS

The *Air CHIEF* CD-ROM is the most comprehensive tool for retrieving emission estimation data. The disc contains a wealth of information, including the AP-42 Volume I, EIIP documents, *L&E* series, *FIRE*, RTECS Chemical Synonym List, the SCC list, and the SIC list. A user manual and installable copies of *FIRE*, *PM Calc*, *PC BEIS*, *Water8* and *Chemdat8* are also included. *Air CHIEF* is available from GPO for $15.00. Call the GPO at 202-512-1800. Contact *Info CHIEF* for more information about the *Air CHIEF* CD-ROM.

The *Factor Information And Retrieval Data System* (*FIRE*) is a PC program containing EPA's recommended criteria and hazardous air pollutant emission estimation factors. Users can browse through records in the database or select specific emission factors. *FIRE* is available from the *CHIEF Website* and is on the *Air CHIEF* CD-ROM. A *FIRE* brochure may be obtained from *Info CHIEF*.



TANKS is a PC software program for estimating volatile organic compound (VOC) emissions from both fixed and floating roof storage tanks. The *TANKS* program is available from the CHIEF Website. Call *Info CHIEF* for a brochure describing *TANKS*.



CHEM9 is a compound properties processor that is based upon an EPA-based compound database of over 1,000 compounds. It provides the capability to estimate compound properties that are not available in the database, including compound volatility and theoretical recovery. *CHEM9* is available from the CHIEF Website. Contact the CHEM9 hotline at (919) 541-5610 for more information.

WATER8 is an analytical model for estimating compound-specific air emissions from wastewater collection & treatment systems. *CHEMDAT8* is a spreadsheet that includes analytical models for estimating VOC emissions from treatment, storage and disposal facility processes. Contact the WATER8 hotline at (919) 541-5610 for more information.

The Personal Computer version of the *Biogenic Emissions Inventory System* (*BEIS*) allows users to estimate hourly emissions of biogenic volatile organic compound and soil nitrogen oxide emissions. *BEIS* is available from the *CHIEF Website*. Contact Tom Pierce at (919) 541-1375 for more information.

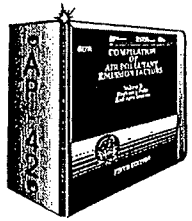
ONLINE TOOLS

Get connected with emission factor and inventory information on the Internet World Wide Web! The *EFIG Home Page* serves as a gateway to many related sites, including the Emission Inventory Improvement Program (EIIP) website, the Office of Mobile Sources and the Unified Air Toxics Website. To access most of the tools featured in this brochure, such as AP-42, the L&E documents, *FIRE* and *TANKS*, visit the *CHIEF Website*. Here is a list of our most popular websites:

CHIEF Website ..... **www.epa.gov/ttn/chief/**
EIIP Website ..... **www.epa.gov/ttn/chief/eiip/**
Unified Air Toxics Website ..... **www.epa.gov/ttn/uatw/**
PM2.5 Resource Center **www.epa.gov/ttn/chief/eiip/pm25inventory/**
National Air Pollutant Emission Trends **www.epa.gov/ttn/chief/trends97/emtrnd.html**
1996 Emission Inventory Website ..... **www.epa.gov/ttn/chief/ei/**

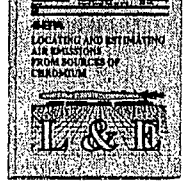
The *CHIEF List Server* allows you to receive announcements relevant to the functions c EFIG and EIIP via e-mail. In addition, you will receive an electronic text version of EFIG quarterly publication, the *CHIEF Newsletter*. To subscribe, send E-mail tc **listserver@unixmail.rtpnc.epa.gov**. In your message type: **subscribe CHIEF** *Firstnam Lastname* (your first and last name).

HARD COPY TOOLS



The *Compilation of Air Pollutant Emission Factors*, AP-42 is the recommended source of air pollutant emission factors for both criteria and toxic emissions. AP-42 Volume I addresses hundreds of stationary, point, and area sources and Volume II deals with mobile sources. EPA emission rates for many polluting activities are obtained from source tests, material balance studies, and engineering estimates and then collected, approved, and compiled into the AP-42 document. AP-42 is available on the *CHIEF* website and from GPO. Call the GPO at 202-512-1800 to order.

The Emission Inventory Improvement Program (EIIP) is a joint program of the EPA, SAEWG, and STAPPA/ALAPCO. The ultimate goal of the EIIP is to provide cost-effective, reliable inventories by improving the quality of emissions data collected and provide for uniform reporting of this information. Their findings are available in a seven volume set of guidance reports, which are available on the EIIP website and from EFIG. For more information, call *Info CHIEF*.



This report series, titled *Locating And Estimating* (L&E) *Air Toxic Emissions From (or of) (Source Category or Substance) (e.g., Locating And Estimating Air Emissions From Sources Of Mercury)* characterize the source categories for which emissions of a toxic substance have been identified. These volumes include general descriptions of the emitting processes, identifying potential release points and emission factors. L&E documents are available from the *CHIEF* website and NTIS (see adjacent table).

Locating & Estimating Document Series

Substance or Source Category	EPA Publication #	Substance or Source Category	EPA Publication #
1,3-Butadiene	EPA-454/R-96-008 PB97-189680	Lead	EPA-454/R-98-006 PB99-116477
Acrylonitrile	EPA-450/4-84-007a PB84-200609	Manganese	EPA-450/4-84-007h PB86-117587
Arsenic & Arsenic Compounds	EPA-454/R-98-013 PB98-163132	Mercury & Mercury Compounds	EPA-454/R-97-012 PB98-117054
Benzene	EPA-454/R-98-011 PB98-159916	Methyl Chloroform	EPA-454/R-93-045 PB94-214137
Cadmium & Cadmium Compounds	EPA-454/R-93-040 PB94-173093	Methyl Ethyl Ketone	EPA-454/R-93-046 PB94-214194
Carbon Tetrachloride	EPA-450/4-84-007b PB84-200625	Methylene Chloride	EPA-454/R-93-006 PB93-207579
Chlorobenzenes	EPA-454/R-93-044 PB95-111340	Nickel	EPA-450/4-84-007f PB84-210968
Chloroform	EPA-450/4-84-007c PB84-200617/A03	Perchloroethylene/Trichlorethylene	EPA-450/2-89-013 PB89-235501/A06
Chromium	EPA-450/4-84-007g PB85-106474/A11	Phosgene	EPA-450/4-84-007i PB86-117595/A04
Chromium (Supplement)	EPA-450/2-89-002 PB90-103243/A04	Polychlorinated Biphenyls (PCB)	EPA-450/4-84-007n PB87-209540/A05
Dioxins & Furans	EPA-454/R-97-003 PB98-116650	Polycyclic Organic Matter (POM)/ Polycyclic Aromatic Hydrocarbons	EPA-450/R-98-014 PB98-1598882
Cyanide Compounds	EPA-450/R-93-041 PB94-118379/A07	Styrene	EPA-454/R-93-011 PB93-207520/A08
Epichlorohydrin	EPA-450/4-84-007j PB86-117603/A04	Toluene	EPA-454/R-93-047 PB94-177607
Ethylene Dichloride	EPA-450/4-84-007d PB84-239193/A05	Vinylidene Chloride	EPA-450/4-84-007k PB86-117611/A04
Ethylene Oxide	EPA-450/4-84-007l PB87-113973/A05	Xylene	EPA-454/R-93-048 PB95-123394
Formaldehyde	EPA-450/4-91-012 PB91-181842/A05		

EXEMPT VOC LIST

VOC (Volatile Organic Compounds) - For all areas in Missouri VOC means any compound of carbon, **excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate,** that participates in atmospheric photochemical reactions to produce ozone. The following compounds will **not** be considered VOC because of their known lack of participation in the atmospheric reactions to produce ozone:

1,1,1,-trichloroethane (methyl chloroform);
1,1,1,3,3,3-hexafluoropropane (HFC-236fa)
1,1,2,2,3-pentafluoropropane (HFC-245ca)
1,1,2,3,3-pentafluoropropane (HFC-245ea)
1,1,1,2,3-pentafluoropropane (HFC-245eb)
1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee)
1,1,1,3,3-pentafluoropropane (HFC-245fa)
1,1,1,2,3,3-hexafluoropropane (HFC-236ea)
1,1,1,3,3-pentafluorobutane (HFC-365mfc)
1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a)
1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)
1-chloro-1-fluoroethane (HCFC-151a)
1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxybutane ($C_4F_9OCH_3$)
2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane $(CF_3)_2CFCF_2OCH_3$
1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane ($C_4F_9OC_2H_5$)
2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane $(CF_3)_2CFCF_2OC_2H_5$
3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)
acetone;
1-chloro-1,1-difluoroethane (HCFC-142b);
chlorodifluoromethane (HCFC-22);
chlorofluoromethane (HCFC-31)
chloropentafluoroethane (CFC-115);
2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124);
dichlorodifluoromethane (CFC-12);
1,1-dichloro-1-fluoroethane (HCFC-141b);
1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114);
1,1,1-trifluoro-2,2-dichloroethane (HCFC-123);
1,1-difluoroethane (HFC-152a);
difluoromethane (HFC-32)
ethane;
ethylfluoride (HFC-161)
methane;
methyl acetate
methylene chloride;
parachlorobenzotrifluoride (PCBTF)
pentafluoroethane (HFC-125);

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perchloroethylene;
1,1,2,2-tetrafluoroethane (HFC-134);
1,1,1,2-tetrafluoroethane (HFC-134a);
trichlorofluoromethane (CFC-11);
1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113);
1,1,1-trifluoroethane (HFC-143a);
trifluoromethane (HFC-23);
cyclic, branched, or linear, completely fluorinated alkanes;
cyclic, branched, or linear, completely fluorinated ethers with no unsaturations; cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations;
cyclic, branched or linear, completely methylated siloxanes; and
sulfur-containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorines.

VOC may be measured by a reference method, an equivalent method, an alternative method or by procedures specified in either 10 CSR 10-6.030 or 40 CFR part 60. These methods and procedures may measure nonreactive compounds, so an owner or operator must exclude these nonreactive compounds when determining compliance.

Updated 10/01

SECTION 112 HAZARDOUS AIR POLLUTANTS 5/4/99 update

The HAPs (Hazardous Air Pollutants) are separated into two categories based on the toxicity of each chemical. Each category has a different emission point reporting level. If a facility emits more than the reporting level for at least one HAP from a single emission point then the amount used and emitted must be reported on the Emission Inventory Questionnaire. NOTE: Criteria pollutant emissions should also be included when checking on the 200 pound reporting level.

Emission reporting levels are: Category 1 HAPs - 20 Lbs/Yr;
Category 2 HAPs - 200 Lbs/Yr

Chemical Abstracts Service Number	Pollutant	VOC	PM
CATEGORY 1 HAZARDOUS AIR POLLUTANTS			
20-01-9	Arsenic Compounds (inorganic including arsine)	No	Yes
1332-21-4	Asbestos	No	Yes
20-06-4	Chromium Compounds	No	Yes
302-01-2	Hydrazine	Yes	No
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin	No	No
CATEGORY 2 HAZARDOUS AIR POLLUTANTS			
75-07-0	Acetaldehyde	Yes	No
60-35-5	Acetamide	Yes	No
75-05-8	Acetonitrile	No	No
98-86-2	Acetophenone	Yes	No
53-96-3	2-Acetylaminofluorene	Yes	No
107-02-8	Acrolein	Yes	No
79-06-1	Acrylamide	Yes	No
79-10-7	Acrylic acid	Yes	No
107-13-1	Acrylonitrile	Yes	No
107-05-1	Allyl chloride	Yes	No
92-67-1	4-Aminobiphenyl	Yes	No
62-53-3	Aniline	Yes	No
90-04-0	o-Anisidine	Yes	No
71-43-2	Benzene (including benzene from gasoline)	Yes	No
92-87-5	Benzidine	Yes	No
98-07-7	Benzotrichloride	Yes	No
100-44-7	Benzyl chloride	Yes	No
92-52-4	Biphenyl	Yes	No
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	Yes	No
542-88-1	Bis(chloromethyl) ether	Yes	No
75-25-2	Bromoform	No	No
106-99-0	1,3-Butadiene	Yes	No
156-62-7	Calcium cyanamide	Yes	No
133-06-2	Captan	Yes	No

63-25-2	Carbaryl	Yes	No
75-15-0	Carbon disulfide	Yes	No
56-23-5	Carbon tetrachloride	Yes	No
463-58-1	Carbonyl sulfide	Yes	No
120-80-9	Catechol	Yes	No
133-90-4	Chloramben	Yes	No
57-74-9	Chlordane	Yes	No
7782-50-5	Chlorine	No	No
79-11-8	Chloroacetic acid	Yes	No
532-27-4	2-Chloroacetophenone	Yes	No
108-90-7	Chlorobenzene	Yes	No
510-15-6	Chlorobenzilate	Yes	No
67-66-3	Chloroform	No	No
107-30-2	Chloromethyl methyl ether	Yes	No
126-99-8	Chloroprene	Yes	No
1319-77-3	Cresol/Cresylic acid (mixed isomers)	Yes	No
95-48-7	o-Cresol	Yes	No
108-39-4	m-Cresol	Yes	No
106-44-5	p-Cresol	Yes	No
98-82-8	Cumene	Yes	No
94-75-7	2,4-D (2,4-Dichlorophenoxyacetic Acid) (including salts and esters)	Yes	No
72-55-9	DDE (1,1-dichloro-2,2-bis(p-chlorophenyl) ethylene)	Yes	No
334-88-3	Diazomethane	Yes	No
132-64-9	Dibenzofuran	Yes	No
96-12-8	1,2-Dibromo-3-chloropropane	Yes	No
84-74-2	Dibutyl phthalate	Yes	No
106-46-7	1,4-Dichlorobenzene	Yes	No
91-94-1	3,3'-Dichlorobenzidine	Yes	No
111-44-4	Dichloroethyl ether (Bis[2-chloroethyl]ether)	Yes	No
542-75-6	1,3-Dichloropropene	Yes	No
62-73-7	Dichlorvos	Yes	No
111-42-2	Diethanolamine	Yes	No
64-67-5	Diethyl sulfate	Yes	No
119-90-4	3,3'-Dimethoxybenzidine	Yes	No
60-11-7	4-Dimethylaminoazobenzene	Yes	No
121-69-7	N,N-Dimethylaniline	Yes	No
119-93-7	3,3'-Dimethylbenzidine	Yes	No
79-44-7	Dimethylcarbamoyl chloride	Yes	No
68-12-2	N,N-Dimethylformamide	Yes	No
57-14-7	1,1-Dimethylhydrazine	Yes	No
131-11-3	Dimethyl phthalate	Yes	No
77-78-1	Dimethyl sulfate	Yes	No
534-52-1	4,6-Dinitro-o-cresol	Yes	No

	(including salts)		
51-28-5	2,4-Dinitrophenol	Yes	No
121-14-2	2,4-Dinitrotoluene	Yes	No
123-91-1	1,4-Dioxane (1,4-Diethyleneoxide)	Yes	No
122-66-7	1,2-Diphenylhydrazine	Yes	No
106-89-8	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	Yes	No
106-88-7	1,2-Epoxybutane	Yes	No
140-88-5	Ethyl acrylate	Yes	No
100-41-4	Ethylbenzene	Yes	No
51-79-6	Ethyl carbamate (Urethane)	Yes	No
75-00-3	Ethyl chloride (Chloroethane)	Yes	No
106-93-4	Ethylene dibromide (Dibromoethane)	No	No
107-06-2	Ethylene dichloride (1,2-Dichloroethane)	No	No
107-21-1	Ethylene glycol	Yes	No
151-56-4	Ethyleneimine (Aziridine)	Yes	No
75-21-8	Ethylene oxide	Yes	No
96-45-7	Ethylene thiourea	Yes	No
75-34-3	Ethylidene dichloride (1,1-Dichloroethane)	Yes	No
50-00-0	Formaldehyde	Yes	No
76-44-8	Heptachlor	Yes	No
118-74-1	Hexachlorobenzene	Yes	No
87-68-3	Hexachlorobutadiene	Yes	No
58-89-9	1,2,3,4,5,6-Hexachlorocyclohexane (all stereo isomers, including lindane)	Yes	No
77-47-4	Hexachlorocyclopentadiene	Yes	No
67-72-1	Hexachloroethane	Yes	No
822-06-0	Hexamethylene diisocyanate	Yes	No
680-31-9	Hexamethylphosphoramide	Yes	No
110-54-3	Hexane	Yes	No
7647-01-0	Hydrochloric acid (Hydrogen chloride)	No	No
7664-39-3	Hydrogen fluoride (Hydrofluoric acid)	No	No
123-31-9	Hydroquinone	Yes	No
78-59-1	Isophorone	Yes	No
108-31-6	Maleic anhydride	Yes	No
67-56-1	Methanol	Yes	No
72-43-5	Methoxychlor	Yes	No
74-83-9	Methyl bromide (Bromomethane)	No	No
74-87-3	Methyl chloride	No	No

	(Chloromethane)		
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	No	No
78-93-3	Methyl ethyl ketone (2-Butanone)	Yes	No
60-34-4	Methylhydrazine	Yes	No
74-88-4	Methyl iodide (Iodomethane)	Yes	No
108-10-1	Methyl isobutyl ketone (Hexone)	Yes	No
624-83-9	Methyl isocyanate	Yes	No
80-62-6	Methyl methacrylate	Yes	No
1634-04-4	Methyl tert-butyl ether	Yes	No
101-14-4	4,4'-Methylenebis(2-chloroaniline)	Yes	No
75-09-2	Methylene chloride (Dichloromethane)	No	No
101-68-8	4,4'-Methylenediphenyl diisocyanate (MDI)	Yes	No
101-77-9	4,4'-Methylenedianiline	Yes	No
91-20-3	Naphthalene	Yes	No
98-95-3	Nitrobenzene	Yes	No
92-93-3	4-Nitrobiphenyl	Yes	No
100-02-7	4-Nitrophenol	Yes	No
79-46-9	2-Nitropropane	Yes	No
684-93-5	N-Nitroso-N-methylurea	Yes	No
62-75-9	N-Nitrosodimethylamine	Yes	No
59-89-2	N-Nitrosomorpholine	Yes	No
56-38-2	Parathion	Yes	No
82-68-8	Pentachloronitrobenzene (Quintobenzene)	Yes	No
87-86-5	Pentachlorophenol	Yes	No
108-95-2	Phenol	Yes	No
106-50-3	p-Phenylenediamine	Yes	No
75-44-5	Phosgene	Yes	No
7803-51-2	Phosphine	No	No
7723-14-0	Phosphorus	No	No
85-44-9	Phthalic anhydride	Yes	No
1336-36-3	Polychlorinated biphenyls (Aroclors)	Yes	No
1120-71-4	1,3-Propane sultone	Yes	No
57-57-8	beta-Propiolactone	Yes	No
123-38-6	Propionaldehyde	Yes	No
114-26-1	Propoxur (Baygon)	Yes	No
78-87-5	Propylene dichloride (1,2-Dichloropropane)	Yes	No
75-56-9	Propylene oxide	Yes	No
75-55-8	1,2-Propylenimine (2-Methylaziridine)	Yes	No

91-22-5	Quinoline	Yes	No
106-51-4	Quinone (p-Benzoquinone)	Yes	No
100-42-5	Styrene	Yes	No
96-09-3	Styrene oxide	Yes	No
79-34-5	1,1,2,2-Tetrachloroethane	Yes	No
127-18-4	Tetrachloroethylene (Perchloroethylene)	No	No
7550-45-0	Titanium tetrachloride	No	No
108-88-3	Toluene	Yes	No
95-80-7	Toluene-2,4-diamine	Yes	No
584-84-9	2,4-Toluene diisocyanate	Yes	No
95-53-4	o-Toluidine	Yes	No
8001-35-2	Toxaphene (chlorinated camphene)	Yes	No
120-82-1	1,2,4-Trichlorobenzene	Yes	No
79-00-5	1,1,2-Trichloroethane	Yes	No
79-01-6	Trichloroethylene	Yes	No
95-95-4	2,4,5-Trichlorophenol	Yes	No
88-06-2	2,4,6-Trichlorophenol	Yes	No
121-44-8	Triethylamine	Yes	No
1582-09-8	Trifluralin	Yes	No
540-84-1	2,2,4-Trimethylpentane	Yes	No
108-05-4	Vinyl acetate	Yes	No
593-60-2	Vinyl bromide	Yes	No
75-01-4	Vinyl chloride	Yes	No
75-35-4	Vinylidene chloride (1,1-Dichloroethylene)	Yes	No
1330-20-7	Xylenes (mixed isomers)	Yes	No
95-47-6	o-Xylene	Yes	No
108-38-3	m-Xylene	Yes	No
106-42-3	p-Xylene	Yes	No
20-00-8	Antimony Compounds	No	Yes
20-03-1	Beryllium Compounds	No	Yes
20-04-2	Cadmium Compounds	No	Yes
20-07-5	Cobalt Compounds	No	Yes
8007-45-2	Coke Oven Emissions	No	No
20-09-7	Cyanide Compounds1	No	No
20-10-0	Glycol ethers2	Yes	No
20-11-1	Lead Compounds	No	Yes
20-12-2	Manganese Compounds	No	Yes
20-13-3	Mercury Compounds (Alkyl&Aryl)	Yes	No
20-13-3	Mercury Compounds (Inorganic)	No	No
TP14	Fine mineral fibers3	No	Yes
20-14-4	Nickel Compounds	No	Yes
TP15	Polycyclic Organic Matter4	Yes	No
TP16	Radionuclides (including radon)5	No	Yes
20-16-6	Selenium Compounds	No	Yes

NOTE: For all listings above which contain the word "compounds" and for glycol ethers, the following applies: Unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named chemical (i.e., antimony, arsenic, etc.) as part of that chemical's infrastructure.

1--X'CN where X = H' or any other group where a formal dissociation may occur. For example, KCN or Ca(CN)2.

2--On January 12, 1999 (FR64:1780), EPA proposed to modify the definition of glycol ethers to exclude surfactant alcohol ethoxylates and their derivatives (SAED). This proposal was based on EPA's finding that emissions, ambient concentrations, bioaccumulation, or deposition of SAED may not reasonably be anticipated to cause adverse human health or environmental effects. EPA also proposed to make conforming changes in the definition of glycol ethers with respect to the designation of hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The proposal reads as follows:

"The definition of the glycol ethers category of hazardous air pollutants, as established by 42 U.S.C. 7412(b)(1) includes mono- and di-ethers of ethylene glycol, diethylene glycol, and triethylene glycol R-(OCH2CH2)n-OR'

Where:

n= 1, 2, or 3
R= alkyl C7 or less, or phenyl or alkyl substituted phenyl
R'= H, or alkyl C7 or less, or carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate."

3 (Under Review)

4 (Under Review)

5A type of atom which spontaneously undergoes radioactive decay.

Code	Control Device Description
000	NO EQUIPMENT -- NOT VALIDATED
001	WET SCRUBBER HIGH EFFICIENCY
002	WET SCRUBBER MEDIUM EFFICIENCY
003	WET SCRUBBER LOW EFFICIENCY
004	GRAVITY COLLECT0R HIGH EFFICIENCY
005	GRAVITY COLLECTOR MEDIUM EFFICIENCY
006	GRAVITY COLLECTOR LOW EFFICIENCY
007	CENTRIFUGAL COLLECTOR HIGH EFFICIENCY
008	CENTRIFUGAL COLLECTOR MEDIUM EFFICIENCY
009	CENTRIFUGAL COLLECTOR LOW EFFICIENCY
010	ELECTROSTATIC PRECIPITATOR HIGH EFFICIENCY
011	ELECTROSTATIC PRECIPITATOR MEDIUM EFFICIENCY
012	ELECTROSTATIC PRECIPITATOR LOW EFFICIENCY
013	GAS SCRUBBER (GENERAL, NOT CLASSIFIED)
014	MIST ELIMINATOR HIGH VELOCITY, I.E., V 250 FT/MIN
015	MIST ELIMINATOR LOW VELOCITY, I.E., V 250 FT/MIN
016	FABRIC FILTER HIGH TEMPERATURE, I.E., T 250 F
017	FABRIC FILTER MEDIUM TEMPERATURE, I.E., 180 F T 250 F
018	FABRIC FILTER LOW TEMPERATURE, I.E., T 180 F
019	CATALYTIC AFTERBURNER
020	CATALYTIC AFTERBURNER WITH HEAT EXCHANGER
021	DIRECT FLAME AFTERBURNER
022	DIRECT FLAME AFTERBURNER WITH HEAT EXCHANGER
023	FLARING
024	MODIFIED FURNACE OR BURNER DESIGN "INCL. LOW NOX BURNER DES"
025	STAGED COMBUSTION
026	FLUE GAS RECIRCULATION
027	REDUCED COMBUSTION AIR PREHEATING
028	STEAM OR WATER INJECTION
029	LOW EXCESS - AIR FIRING
030	USE OF FUEL WITH LOW NITROGEN CONTENT
031	AIR INJECTION
032	AMMONIA INJECTION
033	CONTROL OF %02 IN COMBUSTION AIR (OFF-STOICHIOMETRIC FIRING)
034	WELLMAN-LORD/SODIUM SULFITE SCRUBBING
035	MAGNESIUM OXIDE
036	DUAL ALKALI SCRUBBING
037	CITRATE PROCESS SCRUBBING
038	AMMONIA SCRUBBING
039	CATALYTIC OXIDATION FLUE GAS DESULFURIZATION
040	ALKALIZED ALUMINA
041	DRY LIMESTONE INJECTION
042	WET LIMESTONE INJECTION
043	SULFURIC ACID PLANT CONTACT PROCESS
044	SULFURIC ACID PLANT DOUBLE CONTACT PROCESS
045	SULFUR PLANT
046	PROCESS CHANGE
047	VAPOR RECOVERY SYSTEM (INC. CONDENSERS, HOODING & OTHER ENC)
048	ACTIVATED CARBON ADSORPTION
049	LIQUID FILTRATION SYSTEM
050	PACKED-GAS ABSORPTION COLUMN
051	TRAY-TYPE GAS ABSORPTION COLUMN
052	SPRAY TOWER
053	VENTURI SCRUBBER

Code	Control Device Description
054	PROCESS ENCLOSED
055	IMPINGEMENT PLATE SCRUBBER
056	DYNAMIC SEPARATOR (DRY)
057	DYNAMIC SEPARATOR (WET)
058	MAT OR PANEL FILTER
059	METAL FABRIC FILTER SCREEN (COTTON GINS)
060	PROCESS GAS RECOVERY
061	DUST SUPPRESSION BY WATER SPRAYS
062	DUST SUPPRESSION BY CHEMICAL STABILIZERS OR WETTING AGENTS
063	GRAVEL BED FILTER
064	ANNULAR RING FILTER
065	CATALYTIC REDUCTION
066	MOLECULAR SIEVE
067	WET LIME SLURRY SCRUBBING
068	ALKALINE FLY ASH
069	SODIUM CARBONATE SCRUBBING
070	SODIUM-ALKALI SCRUBBING
071	FLUID BED DRY SCRUBBER
072	TUBE & SHELL CONDENSER
073	REFRIGERATED CONDENSER
074	BAROMETRIC CONDENSER
075	SINGLE CYCLONE
076	MULTIPLE CYCLONE WITHOUT FLYASH REINJECTION
077	MULTIPLE CYCLONE WITH FLYASH REINJECTION
078	BAFFLE
079	DRY ELECTROSTATIC GRANULAR FILTER
080	CHEMICAL OXIDATION
081	CHEMICAL REDUCTION
082	OZONATION
083	CHEMICAL NEUTRALIZATION
084	ACTIVATED CLAY ADSORPTION
085	WET CYCLONIC SEPARATOR
086	WATER CURTAIN
087	NITROGEN BLANKET
088	CONSERVATION VENT
089	BOTTOM FILLING
090	CONVERSION TO VARIABLE VAPOR SPACE TANK
091	CONVERSION TO FLOATING ROOF TANK
092	CONVERSION TO PRESSURIZED TANK
093	SUBMERGED FILLING
094	UNDERGROUND TANK
095	WHITE PAINT
096	VAPOR LOCK BALANCE RECOVERY SYSTEM
097	INSTALL. OF SECONDARY SEAL FOR EXTERNAL FLOATING ROOF TANK
098	MOVING BED DRY SCRUBBER
099	OTHER/NOT CLASSIFIED -- NOT VALIDATED
101	HIGH EFFICIENCY PARTICULATE AIR FILTER

FIPS	County Code	Regional Office	County Name
001	0020	NERO	Adair
003	0040	KCRO	Andrew
005	0060	KCRO	Atchison
007	0080	NERO	Audrain
009	0140	SWRO	Barry
011	0160	SWRO	Barton
013	0180	KCRO	Bates
015	0250	JCRO	Benton
017	0340	SERO	Bollinger
019	0380	JCRO	Boone
021	0520	KCRO	Buchanan
023	0560	SERO	Butler
025	0580	KCRO	Caldwell
027	0620	JCRO	Callaway
029	0640	JCRO	Camden
031	0720	SERO	Cape Gir.
033	0740	NERO	Carroll
035	0780	SERO	Carter
037	0840	KCRO	Cass
039	0860	SWRO	Cedar
041	0920	NERO	Chariton
043	0980	SWRO	Christian
045	1000	NERO	Clark
047	1020	KCRO	Clay
049	1080	KCRO	Clinton
051	1100	JCRO	Cole
053	1140	JCRO	Cooper
055	1160	JCRO	Crawford
057	1240	SWRO	Dade
059	1260	SWRO	Dallas
061	1280	KCRO	Daviess
063	1300	KCRO	DeKalb
065	1360	SERO	Dent
067	1420	SWRO	Douglas
069	1440	SERO	Dunklin
071	1680	SLRO	Franklin
073	1760	JCRO	Gasconade
075	1780	KCRO	Gentry
077	1860	SWRO	Greene
079	1880	NERO	Grundy
081	1940	KCRO	Harrison
083	2020	KCRO	Henry
085	2060	SWRO	Hickory
087	2120	KCRO	Holt
089	2140	NERO	Howard
091	2160	SERO	Howell
093	2200	SERO	Iron
095	2240	KCRO	Jackson
097	2260	SWRO	Jasper
099	2280	SLRO	Jefferson
101	2340	KCRO	Johnson
103	2480	NERO	Knox
105	2500	SWRO	Laclede
107	2540	KCRO	Lafayette
109	2580	SWRO	Lawrence
111	2640	NERO	Lewis
113	2700	SLRO	Lincoln
115	2720	NERO	Linn
117	2740	NERO	Livingston
119	2780	SWRO	McDonald
121	2820	NERO	Macon
123	2840	SERO	Madison
125	2920	JCRO	Maries
127	2940	NERO	Marion
129	3000	NERO	Mercer
131	3040	JCRO	Miller
133	3060	SERO	Mississippi
135	3140	JCRO	Moniteau
137	3160	NERO	Monroe
139	3180	JCRO	Montgomery
141	3200	JCRO	Morgan
143	3300	SERO	New Madrid
145	3320	SWRO	Newton
147	3340	KCRO	Nodaway
149	3460	SERO	Oregon
151	3480	JCRO	Osage
153	3520	SWRO	Ozark
155	3600	SERO	Pemiscot
157	3620	SERO	Perry
159	3660	JCRO	Pettis
161	3680	JCRO	Phelps
163	3700	NERO	Pike
165	3740	KCRO	Platte
167	3780	SWRO	Polk
169	3860	JCRO	Pulaski
171	3880	NERO	Putnam
173	3900	NERO	Ralls
175	3920	NERO	Randolph
177	3940	KCRO	Ray
179	3980	SERO	Reynolds
181	4040	SERO	Ripley
183	4160	SLRO	St. Charles
185	4200	SWRO	St. Clair
187	4220	SERO	St. Francois
510	4280	SL-	St. Louis City
189	4300	SLC	St. Louis
186	4340	SERO	Ste Genevieve
195	4380	NERO	Saline
197	4400	NERO	Schuyler
199	4420	NERO	Scotland
201	4440	SERO	Scott
203	4480	SERO	Shannon
205	4500	NERO	Shelby
207	4600	SERO	Stoddard
209	4620	SWRO	Stone
211	4680	NERO	Sullivan
213	4720	SWRO	Taney
215	4740	SERO	Texas
217	4860	SWRO	Vernon
219	4880	SLRO	Warren
221	4940	SERO	Washington
223	4960	SERO	Wayne
225	5000	SWRO	Webster
227	5140	KCRO	Worth
229	5160	SWRO	Wright
777	7777		Portables

AP-42 Updates

The following is a list of the more recent updates to the AP-42, which are included in Supplements F and G. Please refer to the EPA Tools brochure included in the EIQ instruction packet on the different methods to obtain copies of paper or electronic versions of the updated sections or you can contact EPA at (919) 541-5285.

Chapter & Section	Description	Changes	Date
2002 Supplement			
10.5	Plywood Manufacturing	Major Revision	1-02
10.6.1	Waferboard & Oriented Strand Manufacturing	Major Revision	3-02
10.6.2	Particleboard Manufacturing	Major Revision	6-02
10.6.3	Medium Density Manufacturing	Major Revision	8-02
10.6.4	Hardboard & Fiberboard Manufacturing	New Section	10-02
13.2.1	Paved Roads	Major Revision	10-02
2001 Supplement			
1.6	Wood Residue Combustion in Boilers	Major Revision	7-01
11.1	Hot Mix Asphalt Plants	Major Revision	12-00
11.12	Concrete Batching	Major Revision	10-01

LOCAL AGENCY EIQ CONTACT

City of St. Louis	St. Louis County
Andy Hilliker City of St. Louis Division of Air Pollution Control 1415 North 13th Street St. Louis, MO 63106 **Phone:** (314) 613-7300 **Fax:** (314) 613-7275	Sue Ehrhardt St. Louis County Department of Health Air Pollution Control Section 111 South Meramec Clayton, MO 63105 **Phone:** (314) 615-8916 **Fax:** (314) 615-8951
City of Kansas City	**City of Springfield**
Michelle Meyer Kansas City Health Department Air Quality Program 2400 Troost Avenue 3rd Floor, Suite 3000 Kansas City, MO 64108 **Phone:** (816) 513-6314 **Fax:** (816) 513-6290	Brian Adams Springfield-Greene County Air Pollution Control Authority 227 East Chestnut Expressway Springfield, MO 65802 **Phone:** (417) 864-1662 **Fax:** (417) 864-1499

Missouri Department of Natural Resources

Air Pollution Control Program	Environmental Assistance Office
Emissions Inventory Unit 205 Jefferson Street P.O. Box 176 Jefferson City, MO 65102 **Phone:** (573) 751-4817 **Fax:** (573) 751-2706	Environmental Assistance Office 1659-B East Elm P.O. Box 176 Jefferson City, MO 65102 **Phone:** (800)361-4827 or (573)526-6627 **Fax:** (573) 526-5808 St. Louis Contact Nancy Morgan (314) 301-7600 Kansas City Contact Gus Ralston (816) 554-4100

CHECKLIST

Before Mailing Your EIQ, Have You...

_____ 1. signed and dated the EIQ (Form 1.0)?

_____ 2. enclosed all worksheets used and listed them on Form 1.2?

_____ 3. placed county and plant numbers on your fee payment check and on all forms and documentation?

_____ 4. requested that the county and plant identification be included with the check? (This applies if check will be mailed from corporate headquarters.)

_____ 5. made sure that all units used are identical to the units associated with the SCC assigned to the point?

_____ 6. supplied a "best available" maximum hourly design rate for each process?

_____ 7. included necessary documentation such as flow charts and Material Safety Data Sheets?

_____ 8. completed all required information on Form 2.0, such as SCC number, annual throughput, maximum hourly design rate, emission factor, actual emissions?

_____ 9. reviewed list of AP-42 Section Updates to see if applied to your facility?

_____ 10. checked Exempt VOC List?

_____ 11. read the Overview for the description of each form. If you need additional forms, notify your local air pollution agency on the EIQ Contact List?

_____ 12. identified source of emission factor on Form 2.0 and included, if applicable, the AP-42 section, table or figure number?

Please **DO NOT RETURN** this checklist!

EMISSIONS INVENTORY QUESTIONNAIRE (EIQ)

SUPPLEMENTAL WORKSHEET INSTRUCTIONS

2002

Missouri Department of Natural Resources
Air and Protection Division
Air Pollution Control Program
Post Office Box 176
205 Jefferson Street, Room 120
Jefferson City, Missouri 65102

Telephone: (573) 751-4817

TABLE OF CONTENTS
SUPPLEMENTAL WORKSHEETS

INSTRUCTIONS

FORM 2.0C CONTROL DEVICE INFORMATION

This form should be used if a facility has more than two control devices operating at one emission point. If you are reporting different control efficiencies on Form 2.T for different Hazardous Air Pollutants (HAPs), you must fill out this form no matter the number of control devices operating at the emission point. When there are more than two control devices operating at the emission point, Form 2.0C will be used to describe the characteristics of control devices three, four, and beyond. Attached sheets may also be used in place of this form.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**
See Form 1.0 instructions, page 1.0-1.

The **Point Number, AIRS ID-Pt, SCC (Source Classification Code)**, and **Seg No.** will need to be the same as those indicated on the Form 2.0 that must accompany this form.

If you are reporting the same control efficiency for all HAP chemicals for a control device, list the % efficiency under **HAP(s)**. If a different control efficiency is used for different HAP chemicals, please list the specific chemical under **HAP Chemical Name**. For example:

> A facility is reports that control device CD1 has a control efficiency of 80% for Toluene, 60% for Xylenes and 70% for all other HAPs emitted at that emission point. In this case, there would be three separate entries on Form 2.0C for the same control device. Line 1 would list CD1, the device code, 80% under **HAP(s)**, and "Toluene" under **HAP Chemical Name**. The next line would list the same control device information, but would report the 60% for Xylene. The third line would have the same device information, but would list 70% control efficiency under **HAPs** and leave **HAP Chemical Name** blank, as multiple HAPs are being grouped together under the 70% efficiency.

INSTRUCTIONS
FORM 2.0L LANDFILL INFORMATION

This form should be used if a facility is a landfill or has a landfill on the premises.

Complete **Facility Name**, **County Number**, **Plant Number** and **Year of Data**.
See Form 1.0 instructions, Page 1.0-1.

The **Point Number**, **AIRS ID-Pt**, **SCC** and **Segment Number**, will be the same as those indicated on the Form 2.0 that must accompany this form.

Section 1 is for determining the New Source Performance Standard (NSPS) Classification. All landfills need to fill out this section of the worksheet.

Type of Landfill - put an "X" in the block that most accurately describes the landfill.

New - a new Municipal Solid Waste (MSW) landfill is a landfill for which construction, modification, or reconstruction commences on or after the date of May 30, 1991 or that began accepting waste on or after that date.

Existing - an existing MSW landfill is a landfill for which construction, reconstruction or modification was commenced before May 30, 1991, and has accepted waste anytime since November 8, 1987, or has additional design capacity available for future waste deposition. An existing MSW landfill may be active (currently accepting waste, or have additional capacity available to accept waste) or may be closed (no longer accepting waste nor having available capacity for future waste deposition). Closed landfills that have accepted waste after November 8, 1987 are considered existing landfills.

Closed - landfill has gone through closure with the Department of Natural Resources Solid Waste Management Program or the EPA.

Type of Control - put an "X" in the block that most accurately describes the control equipment present at the landfill. According to the NSPS standard the state plan has three options for the control of collected MSW landfill emissions by using control devices:

Flare - an open flare designed and operated in accordance with the parameters established in 40 CFR Part 60.18; or

Control System - a control system designed and operated to reduce NMOC by 98 weight percent; or

Enclosed Combustor - and enclosed combustor designed and operated to reduce the outlet NMOC concentration to 20 parts per million as hexane by volume, dry basis at 3 percent oxygen, or less.

Is the Landfill Accepting Waste? Put an "X" in the block that indicates whether the landfill is currently accepting waste. If the landfill is not currently accepting waste, put the date of the last waste acceptance in the block labeled "**If No, Date of last waste acceptance.**"

Landfill Design Capacity - the maximum amount of waste (volume) that the landfill will be able to accept in Megagrams (Mg) or cubic meters (m^3).

If the maximum amount of waste is known in cubic yards, the following equation can

$$cubicmeters = (cubicyards)\left(0.76458\frac{m^3}{ydsup3}\right)$$

convert it to cubic meters:
If the maximum amount of waste is known in tons, the following equation can convert it

$$Megagrams = (Tons)\left(0.90718\frac{Mg}{Tons}\right)$$

to Megagrams:
Design Capacity Units - the units used in the reported Landfill Design Capacity. The units should be Mg or m^3.

Age of the Landfill - time since the initial refuse placement in years.

Example: If the landfill opened in March of 1992 and started accepting waste in June of 1992 and is currently still accepting waste, the age of the landfill for the 1996 emission year would be:

December 1996 - June 1992 = 4 years and 7 months = 4 +(7/12) = 4.583 years

Mass of solid waste in the landfill (Mg) - the amount of degradable solid waste that has been accepted into the landfill. The mass of nondegradable solid waste should be subtracted from the total mass of solid waste accepted into the landfill to calculate this value. For the emission year, this would be the mass of solid waste accepted into the landfill from the initial refuse placement until December 31 of the reporting year. This is the value that should also be reported on Form 2.0 as the throughput.

Nondegradable waste is any waste that does not decompose through chemical breakdown or microbiological activity. Examples are, but are not limited to, concrete,

municipal waste combustor ash, and metals.

Nonmethane Organic Compound Emission Rate (Mg/Yr) - this value can be calculated by one of the two following methods:

- The following equation should be used if the actual year-to-year solid waste acceptance rate is known.

$$M_{NMOC} = \sum_{i=1}^{n} 2kL\,M_i\left(e^{-ktsubi}\right)(CNMOC)(3.6\_10^{-9})$$

Where:

M_{NMOC}	= Total NMOC emission rate from the landfill, Mg/yr
k	= methane generation rate constant, /yr = 0.05 /yr
L	= methane generation potential, m^3/Mg solid waste = 170 m^3/Mg
M_i	= mass of solid waste in the i^{th} section, Mg
t_i	= age of the i^{th} section, years
CNMOC	= concentration of NMOC, ppmv as hexane = 4000 ppmv hexane
3.6×10^{-9}	= conversion factor

Note: The values for k, L, and CNMOC in Section 1, in the absence of site-specific data, are 0.05/yr, 170 m^3/Mg, and 4000 ppmv as hexane, respectively.

Example: A landfill opened in January of 1987. The landfill contains three sections of waste that have opened on different dates throughout the years. Section 1 opened January 1, 1987, closed December 30, 1990, and contains 100,000 Mg of waste. Section 2 opened March 1, 1991, closed August 30, 1995 and contains 68,640 Mg of waste. Section 3 opened May 1, 1994, contains 87,500 Mg of waste and is currently still accepting waste. We want to know the NMOC emission rate from the landfill for the 1996 emission year.

M_{NMOC} = ? Mg/yr k = 0.05/yr L = 170 m3/Mg
M_1 = 100,000 Mg M_2 = 68,640 Mg M_3 = 87,500 Mg
t_1 = (December 30, 1996 - January 1, 1987) = 9.0 years
t_2 = (December 30, 1996 - March 1, 1991) = 5 +(10/12) = 5.833 years
t_3 = (December 30, 1996 - May 1, 1994) = 2 + (8/12) = 2.667 years

$$M_{NMOC} = \sum_{i=1}^{n} 2kL\,M_i\left(e^{-kt_i}\right)(CNMOC)(3.6\_10^{-9}) = 2kL(CNMOC)(3.6\_10^{-9})\sum_{i=1}^{n} M_i\left(e^{-kt_i}\right)$$

$$M_{NMOC} = 2(0.05/yr)\left(170\frac{m^3}{Mg}\right)(4000ppmvhexane)(3.6\_10^{-9})\sum_{i=1}^{n} M_i(e^{-kt_i})$$

CNMOC = 4000 ppmv hexane

$$M_{NMOC} = (2.448\_10^{-4}/yr)\sum_{i=1}^{n} M_i(e^{-kt_i}) = (2.448\_10^{-4}/yr)(M_1 e^{-kt_1} + M_2 e^{-kt_2} + M_3 e^{-kt_3})$$

- The following equation should be used if the actual year-to-year solid waste acceptance

$$M_{NMOC} = 2LR(e^{-kc} - e^{-kt})(CNMOC)(3.6\_10^{-9})$$

$$M_{MNOC} = (2.448\_10^{-4}/yr)[100{,}000Mg\, e^{-(0.05/yr)(9.0yr)} + 68{,}640\, e^{-(0.05)(5.833)} + 87{,}500\, e^{-(0.05)(2.667)}]$$

$$M_{NMOC} = (2.448\_10^{-4}/yr)[63{,}762.815 + 51{,}276.136 + 76{,}576.389Mg]$$

$$M_{NMOC} = (2.448\_10^{-4}/yr)[191615.34Mg] = 46.907Mg/yr$$

rate is unknown.

Where,

M_{NMOC}	= mass emission rate of NMOC, Mg/yr
L	= methane generation potential, m^3/Mg solid waste = 170 m^3/Mg
R	= average annual acceptance rate, Mg/yr. The mass of nondegradable solid waste may be subtracted from the average annual acceptance rate when calculating this value.
k	= methane generation rate constant, /yr = 0.05 /yr
c	= time since closure, years. For active landfills c= 0 and e^{-kc} =1.
t	= age of landfill, years
CNMOC	= concentration of NMOC, ppmv as hexane = 4000 ppmv hexane
3.6×10^{-9}	= conversion factor

Example: A landfill opened in January of 1987. The landfill contains 525,000 Mg of waste that it has collected over the years and is currently still accepting waste. We want to know the NMOC emission rate from the landfill for the 1996 emission year.

M_{NMOC} = ? Mg/yr k = 0.05/yr L = 170 m3/Mg
t = (December 30, 1996 - January 1, 1987) = 9.0 years
c = 0 CNMOC = 4000 ppmv hexane
R = 525,000 Mg/ 9 years = 58,333.333 Mg/yr

$$M_{NMOC} = 2LR\left(e^{-kc} - e^{-kt}\right)(CNMOC)(3.6\_10^{-9})$$

$$M_{MNOC} = 2\left(170\frac{m^3}{Mg}\right)\left(58{,}333.333\frac{Mg}{yr}\right)\left(1 - e^{-(0.05/yr)(9.0yr)}\right)(4000ppmvhexane)(3.6\_10^{-9})$$

$$M_{MNOC} = \left(19833330\frac{m^3}{yr}\right)(1 - 0.6376)(4000ppmvhexane)(3.6\_10^{-9})$$

$$M_{MNOC} = 103.50\frac{Mg}{yr}$$

Section 2 is for deriving VOC and HAP emission factors.

Methane Generation Rate Constant - k - (/yr) - The methane generation rate constant is based upon the moisture in the landfill. The recommended value for k in MissourI, which should only be used for calculations in Section 2, is k =0.04 / yr.

Methane Generation Potential - L - (m^3/Mg) - The recommended value for L in Missouri, which should only be used for calculations in Secion 2, is L = 125 m^3/Mg.

Time since Landfill Closure - c - (yrs) - The amount of time since closure of the landfill in years. For active landfills c = 0. This should be calculated in the same manner as the age of the landfill.

Average Annual Refuse Acceptance Rate - R - (Mg/yr) - Site-specific landfill information is generally available for the average refuse acceptance rate. When refuse acceptance rate information is scant or unknown, R can be determined by dividing the refuse in place by the amount of time that the landfill was accepting waste. Nondegradable refuse should be subtracted from the mass of the acceptance rate to prevent overestimation of methane generation. The average annual acceptance rate should only be estimated by the above method when there is inadequate information available on the actual average acceptance rate.

Methane Generation Rate - QCH4 - (m^3/yr) - this value can be calculated by the following

$$QCH4 = LR\left(e^{-kc} - e^{-kt}\right)$$

equation:
Where:

QCH4 = Methane generation rate m^3/yr
L = Methane generation potential m^3 CH_4/Mg refuse
R = Average annual refuse acceptance rate during active life, Mg/yr
e = Base log, unitless
k = Methane generation rate constant, /yr
c = Time since landfill closure
t = Time since the initial refuse placement

Note: The values for k and L in Section 2 are 0.04 /yr and 125 m^3/Mg, respectively.

Total NMOC Concentration in Landfill gas - CNMOC - (ppmv as hexane) - If site-specific total NMOC concentration is available (as measured by EPA Reference Method 25C), it must be corrected for air infiltration into the collected landfill gas before it can be combined with the estimated landfill gas emissions to estimate total NMOC emissions. The total NMOC concentration is adjusted for air infiltration by assuming that CO_2 and CH_4 are the primary (100 percent) constituents of landfill gas, by the following equation:

$$\frac{C_{NMOC}(ppmvashexane)(1\_10^6)}{C_{CO_2}(ppmv)+C_{CH_4}(ppmv)} = CNMOCppmvashexane$$

Where:

C_{NMOC}	= Total NMOC concentration (as measured) in landfill gas, ppmv as hexane
C_{CO2}	= CO2 concentration in landfill gas, ppmv
C_{CH4}	= CH4 concentration in landfill gas, ppmv
1×10^6	= Constant used to correct NMOC concentration to units of ppmv
CNMOC	= Total NMOC concentration adjusted for air infiltration in landfill gas, ppmv as hexane

Values for C_{CO2} and C_{CH4} can usually be found in the source test report for the particular landfill along with the total NMOC concentration data.

If site-specific information is not available, there are two values that can be used for CNMOC:

CNMOC = 2420 ppmv for landfills known to have co-disposal of MSW and commercial/industrial organic wastes, or

CNMOC = 595 ppmv for landfills known to contain only MSW or to have very little organic commercial/industrial wastes.

NMOC Emission Rate - QNMOC - (m^3/yr) - To estimate the total NMOC emissions, the

$$QNMOC = \frac{2QCH4(CNMOC)}{(1\_10^6)}$$

following equation should be used:

Where:

QNMOC	= NMOC emission rate, m3/yr
QCH4	= CH_4 generation rate, m^3/yr
CNMOC	= Total NMOC concentration in landfill gas, ppmv as hexane
2	= Multiplication factor

Uncontrolled NMOC Mass Emissions - MNMOC - (lbs/yr) - the following equation can estimate the mass emissions per year of total NMOCs:

$$MNMOC = QNMOC\left[\frac{1050.2}{(273.15+T)}\right]\left(\frac{2.2046lbs}{1kg}\right)$$

Where:

MNMOC = NMOC (total) mass emissions (lbs/yr)
QNMOC = NMOC emission rate (m^3/yr)
T = Temperature of landfill gas (°C)
2.2046 = Conversion factor from kilograms to pounds

This equation assumes that the operating pressure of the system is approximately 1 atmosphere, and represents total NMOCs, based on the molecular weight of hexane. If the temperature of the landfill gas is not known, a temperature of 25°C is recommended.

Uncontrolled NMOC Emissions Reported as HAPs - HNMOC - (lbs/yr) - Uncontrolled emission concentrations of individual NMOCs along with some inorganic compounds are presented in Tables 2.4-1 from the AP-42. Table 2.4-2 from the AP-42 presents the corrected concentrations for benzene and toluene to use based on the site's co-disposal history. The uncontrolled individual NMOC emissions that are HAPs must be calculated for each specific chemical and reported on the Form 2.T. The following calculations provide the information that is necessary to fill out the Form 2.T.

$$QNMOC = \frac{2QCH4(CNMOC)}{(1\_10^6)}$$

The following equations can estimate Individual NMOC emissions
Where:

QNMOC = NMOC emission rate of a specific chemical from Tables 2.4-1 or 2.4-2
QCH4 = Methane Generation rate, m^3/yr
CNMOC = NMOC concentration of a specific chemical from Tables 2.4-1 or 2.4-2 in landfill gas, ppmv
2 = Multiplication factor

The following equation can estimate the mass emissions per year of each individual landfill gas

compound:
Where:

INMOC = Individual NMOC mass emissions for a specific chemical from Tables 2.4-1 or 2.4-2
QNMOC = NMOC mass emission rate from the above equation
T = Temperature of landfill gas (°C)
2.2046 = Conversion Factor from kilograms to pounds

$$INMOC = QNMOC[INMOCFACTOR]$$

The above equation can be simplified to the following equation:
Where at 25°C:

$$INMOCFACTOR = \left[\frac{(Molecularweightofcompound)}{\left(8.205\_10^{-5}\frac{m^3 - atm}{mol - K}\right)(1000g)(298.15)}\right]\left(\frac{2.2046lbs}{1kg}\right)$$

Values for the INMOC FACTOR at 25°C are supplied for each chemical in Tables A, B, or C. Table A lists the chemicals that are only HAPs. Table B lists the chemicals that are both HAPs and volatile organic compounds (VOCs). Table C lists the chemicals that are only VOCs.

The individual NMOC mass emissions need to be calculated for each of the HAPs listed in Tables 2.4-1 and 2.4-2. The HAPs that are VOCs need to be reported as VOCs and not as HAPs. Form 2.T needs to be filled out with the individual NMOC mass emissiouns of each HAP being reported as VOCs or HAPs. The chemicals that should be listed on Form 2.T as HAPs are in Table A. The chemicals that should be listed on Form 2.T as VOC are in Table B. The chemical that are only VOCs appear in Table C. (Note: the individual NMOC mass emissions of the chemicals in Table C do not need to be listed on any form) When all of these values are calculated, the uncontrolled NMOC emissions as HAPs can be obtained from the Form 2.T. The uncontrolled NMOC emissions as VOCs can be obtained by adding the VOC emissions from 2.T and those calculated from the chemicals on Table C.

Note: On Table B, benzene and toluene have three options; co-disposal, no co-disposal, or unknown. The NMOC mass emission needs to be calculated for only one of the three choices depending on which best describes the landfill.

HAP Emission Factor: this value can be calculated by dividing the uncontrolled NMOC

emissions reported as HAPs (lbs./yr.) on Form 2.T by the throughput (Mg).

VOC Emission Factor: this value can be calculated by first adding the uncontrolled NMOC emissions reported as VOCs (lbs./yr.) on Form 2.T and the uncontrolled emissions calculated from Table C (lbs./yr.). (note: The VOC mass emissions should be found this way instead of subtracting the uncontrolled NMOC emissions reported as HAPs from the uncontrolled NMOC mass emissions.) The total VOC emissions are then divided by the throughput (Mg).

CO Emission Factor: the INMOC FACTOR for carbon monoxide is provided beneath Table C so that the CO emission factor and mass emissions can be calculated and reported on Form 2.0. The CO emission factor could also be found using the AP-42.

LANDFILL EMISSIONS SPREADSHEET

Chemical	CAS #	molec. weight	Default Concentration (ppmv)	INMOC factor
(Part A) HAPS ONLY				
111 Trichloroethane	71556	133.41	0.48	12.02
Dichloromethane	75092	84.94	14.3	7.65
12 Dichloroethane	107062	98.96	0.41	8.92
Chloroform	67663	119.39	0.03	10.76
Chloromethane	748730	50.49	1.21	4.55
Perchloroethylene	127184	165.83	3.73	14.94
Mercury	20133	200.61	0.000292	18.08
(Part B) HAPS & VOC				
1122 Tetrachloroethane	79345	167.85	1.11	15.13
11 Dichloroethane	75343	98.97	2.35	8.92
11 Dichloroethylene	75354	96.94	0.2	8.74
12 Dichloropropane	78875	112.99	0.18	10.18
Acrylonitrile	107131	53.06	6.33	4.78
Carbon disulfide	75150	76.13	0.58	6.86
Carbon tetrachloride	56235	153.84	0.004	13.86
Carbonyl sulfide	463581	60.07	0.49	5.41
Chlorobenzene	108907	112.56	0.25	10.14
Chloroethane	75003	64.52	1.25	5.81
Dichlorobenzene	106467	147	0.21	13.25
Ethyl benzene	100414	106.16	4.61	9.57
Ethylene dibromide	106934	187.88	0.001	16.93
Hexane	110543	86.18	6.57	7.77
Vinyl chloride	75014	62.5	7.34	5.63
Methyl ethyl ketone	78933	72.11	7.09	6.5
Methyl isobutyl ketone	108101	100.16	1.87	9.03
Trichloroethylene	79016	131.4	2.82	11.84
Xylene	1330207	106.16	12.1	9.57
Benzene	71432	78.11	11.1	7.04
Toluene	108883	92.13	165	8.3
(Part C) VOC ONLY				
2 Propanol		60.11	50.1	5.42
Bromodichlormethane		163.83	3.13	14.77
Butane		58.12	5.03	5.24
Dimethyl sulfide		62.13	7.82	5.6
Ethanol		46.08	27.2	4.15
Fluorotrichloromethane		137.38	0.76	12.38
Pentane		72.15	3.29	6.5
Propane		44.09	11.1	3.97
Carbon Monoxide				2.52

Table 2.4-1. DEFAULT CONCENTRATIONS FOR LFG CONSTITUENTS[a]

(SCC 50100402, 50300[illegible])

Compound	Molecular Weight	Default Concentration (ppmv)	Emission Factor Rating
1,1,1-Trichloroethane (methyl chloroform)[a]	133.41	0.48	B
1,1,2,2-Tetrachloroethane[a]	167.85	1.11	C
1,1-Dichloroethane (ethylidene dichloride)[a]	98.97	2.35	B
1,1-Dichloroethene (vinylidene chloride)[a]	96.94	0.20	B
1,2-Dichloroethane (ethylene dichloride)[a]	98.96	0.41	B
1,2-Dichloropropane (propylene dichloride)[a]	112.99	0.18	D
2-Propanol (isopropyl alcohol)	60.11	50.1	E
Acetone	58.08	7.01	B
Acrylonitrile[a]	53.06	6.33	D
Bromodichloromethane	163.83	3.13	C
Butane	58.12	5.03	C
Carbon disulfide[a]	76.13	0.58	C
Carbon monoxide[b]	28.01	141	E
Carbon tetrachloride[a]	153.84	0.004	B
Carbonyl sulfide[a]	60.07	0.49	D
Chlorobenzene[a]	112.56	0.25	C
Chlorodifluoromethane	86.47	1.30	C
Chloroethane (ethyl chloride)[a]	64.52	1.25	B
Chloroform[a]	119.39	0.03	B
Chloromethane	50.49	1.21	B
Dichlorobenzene[c]	147	0.21	E
Dichlorodifluoromethane	120.91	15.7	A
Dichlorofluoromethane	102.92	2.62	D
Dichloromethane (methylene chloride)[a]	84.94	14.3	A
Dimethyl sulfide (methyl sulfide)	62.13	7.82	C
Ethane	30.07	889	C
Ethanol	46.08	27.2	E
Ethyl mercaptan (ethanethiol)	62.13	2.28	D
Ethylbenzene[a]	106.16	4.61	B
Ethylene dibromide	187.88	0.001	E
Fluorotrichloromethane	137.38	0.76	B
Hexane[a]	86.18	6.57	B
Hydrogen sulfide	34.08	35.5	B
Mercury (total)[a,d]	200.61	2.92×10^{-4}	E

Table 2.4-1. (Concluded)

Compound	Molecular Weight	Default Concentration (ppmv)	Emission Factor Rating
Methyl ethyl ketone[a]	72.11	7.09	A
Methyl isobutyl ketone[a]	100.16	1.87	B
Methyl mercaptan	48.11	2.49	C
Pentane	72.15	3.29	C
Perchloroethylene (tetrachloroethylene)[a]	165.83	3.73	B
Propane	44.09	11.1	B
t-1,2-dichloroethene	96.94	2.84	B
Trichloroethylene (trichloroethene)[a]	131.40	2.82	B
Vinyl chloride[a]	62.50	7.34	B
Xylenes[a]	106.16	12.1	B

NOTE: This is not an all-inclusive list of potential LFG constituents, only those for which test data were available at multiple sites. References 10-67. Source Classification Codes in parentheses.

[a] Hazardous Air Pollutants listed in Title III of the 1990 Clean Air Act Amendments.

[b] Carbon monoxide is not a typical constituent of LFG, but does exist in instances involving landfill (underground) combustion. Therefore, this default value should be used with caution. Of 18 sites where CO was measured, only 2 showed detectable levels of CO.

[c] Source tests did not indicate whether this compound was the para- or ortho- isomer. The para isomer is a Title III-listed HAP.

[d] No data were available to speciate total Hg into the elemental and organic forms.

Table 2.4-2. DEFAULT CONCENTRATIONS OF BENZENE, NMOC, AND TOLUENE BASED ON WASTE DISPOSAL HISTORY[a]

(SCC 50100402, 50300603)

Pollutant	Molecular Weight	Default Concentration (ppmv)	Emission Factor Rating
Benzene[b]	78.11		
Co-disposal		11.1	D
No or Unknown co-disposal		1.91	B
NMOC (as hexane)[c]	86.18		
Co-disposal		2420	D
No or Unknown co-disposal		595	B
Toluene[b]	92.13		
Co-disposal		165	D
No or Unknown co-disposal		39.3	A

[a] References 10-54. Source Classification Codes in parentheses.

[b] Hazardous Air Pollutants listed in Title III of the 1990 Clean Air Act Amendments.

[c] For NSPS/Emission Guideline compliance purposes, the default concentration for NMOC as specified in the final rule must be used. For purposes not associated with NSPS/Emission Guideline compliance, the default VOC content at co-disposal sites = 85 percent by weight (2,060 ppmv as hexane); at No or Unknown sites = 39 percent by weight 235 ppmv as hexane).

INSTRUCTIONS
FORM 2.T HAZARDOUS AIR POLLUTANT WORKSHEET

This form should be completed to report the emissions of any Hazardous Air Pollutant (HAP) regulated under Section 112 (b) of the 1990 revisions to the Clean Air Act. Form 2.T should be used to list all HAP(s) emitted from a single emission point. Those HAPs that are either Volatile Organic Compounds (VOCs) or Particulate Matter less than 10 microns (PM10) should be reported as VOCs or PM10 on Form 2.0 **and** on Form 2.T. For HAPs that are not VOCs or PM10, use Form 2.T to generate a HAP emission factor and report these emissions on Form 2.0.

Beginning with the 2002 EIQ submittal, facilities will be asked to report controlled HAP emissions on Form 2.T, as well as the uncontrolled HAP emissions they have reported in past years. This will allow companies, if they choose, to report specific control efficiencies for individual HAPs.

The HAPs are separated into two groups or categories with different emission point level reporting thresholds based on the toxicity of the specific HAP chemical. The first group (Category 1) consists of a small set of the most hazardous or toxic chemicals that have an annual **emission point reporting level of 20 pounds** or more emitted per year. If a total of 20 lbs. or more of Category 1 HAPs is emitted from an emission point, then **all** HAP emissions must be reported on a Form 2.T on the EIQ.

All other HAP chemicals are in the second group (Category 2) with an annual **emission point reporting level of 200 pounds** or more emitted per year. The reporting requirements for Category 2 HAPs are the same as those for the criteria pollutants. If the total of all pollutants emitted at a point exceeds 200 lbs. or more, then **all** HAP emissions must be reported on a Form 2.T.

Example: A facility emits 100 lbs. of toluene, 100 lbs. of xylene, and 75 lbs. of hexane.
All three HAP chemicals would be listed on Form 2.T. Even though each air pollutant is lower than 200 lbs., the sum of the emissions for this point exceeds the threshold of 200 lbs.

Attached to this worksheet instruction set is a list of the HAPs regulated under the Clean Air Act. This list provides the CAS (Chemical Abstract Service Registry Number), indicates if the chemical should be reported as a VOC or PM10, and identifies some of the possible synonyms for each HAP.

***** PLEASE NOTE *****
MANY OF THE HAPS FOR WHICH EMISSIONS ARE TO BE REPORTED SHOULD HAVE ALREADY BEEN REPORTED, EITHER AS A VOC (Volatile Organic Compound) OR AS PM10 (Particulates) ON A FORM 2.0. BE CAREFUL NOT TO COUNT THE AMOUNT OF HAPS RELEASED MORE THAN ONCE FOR THE PURPOSES OF CALCULATING THE EMISSIONS FEE.

Instructions for Form 2.T
Hazardous Air Pollutant Worksheet
Continued

Each row on Form 2.T should be used to report the required information for a single HAP at a point. Use special care when entering information in Column 6, "Uncontrolled Emissions Reported as HAPs (Lbs/Yr)". Supplying information in Column 6 for emissions already reported as a VOC or PM10 will lead to the HAP emissions being counted twice and result in the emissions fee payment being higher than required. If worksheets are not being used to calculate the emissions, documentation should be provided to verify the emission figures. Include all emission point numbers on documentation.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**

Point Number: This is the unique identification number for each specific process. This identification must match the point number entered on Form 1.1 - Process Flow Diagram, Form 1.2 - Summary of Emission Points and Form 2.0 - Emission Point Information.

Source Classification Code (SCC): List the code that identifies the type of process associated with this emission point.

1) HAZARDOUS AIR POLLUTANT (HAP) CHEMICAL

A single box in Column 1 should be used to list the most common chemical name or synonym for a HAP chemical that is being reported.

2) CAS No.

The Chemical Abstract Service Registry (CAS) Number is a unique number for each chemical or group of chemicals. Enter the CAS number for the specific HAP chemical used or handled in a box in Column 2. The HAPs List provides a list of the CAS Number(s) for each HAP or group of HAPs regulated under the Clean Air Act. A CAS Number **must** accompany each individual HAP listed on Form 2.T.

3) AMOUNT USED OR HANDLED (LBS/YR)

Enter the amount of the HAP chemical that was used or handled at this point. The amount of HAP chemical entered should be reported in pounds per year.

4) UNCONTROLLED AMOUNT EMITTED (LBS/YR)

Enter the amount of the HAP chemical that was actually emitted from the point, or if control equipment is present- enter the amount emitted before control equipment reductions are applied. Be sure to enter this information in either Column 5 or 6 also. The emission figure should be in pounds of the HAP chemical emitted per year.

Documentation (worksheets, etc.) needs to be provided if the uncontrolled amount emitted does not equal the amount used or handled provided in Column 3. The documentation needs to explain the differences between Columns 3 and 4: whether it is a mass balance calculation, if material is being shipped as hazardous waste, or if a portion of the HAP chemical is being retained in the final product, etc.

5) UNCONTROLLED EMISSIONS REPORTED AS VOC OR PM10 (LBS/YR)

If a HAP chemical at this point has already been reported as PM_{10} or VOC, enter the HAP emissions in pounds per year. This will ensure that the HAP chemical being emitted is not double counted toward the emissions fee. The total amount of all HAP chemicals at this point should be summed and entered in the HAP Emission Totals box provided at the bottom of Block 5. The HAP emission total should be calculated in pounds emitted per year.

6) UNCONTROLLED EMISSIONS REPORTED AS HAPs (LBS/YR)

Enter the amount of HAP emissions at this point that have not been reported as VOC or PM_{10}. Sum all the entries in Column 6 and record that total in the HAP Emission Totals box provided at the bottom of Block 6. This total figure must be in pounds emitted per year.

7) HAP CONTROL DEVICES

List any control devices by device number (i.e. CD01, CD02, etc.) that control the listed HAP chemical.

8) CONTROL EFFICIENCY (%)

If a control device is present, please enter the control efficiency for each HAP chemical that has emissions. This refers to the **overall** control efficiency for the HAP chemical.

(See Form 2.0 instructions for further explanation and an example)

9) ACTUAL EMISSIONS REPORTED AS VOC OR PM10 (LBS/YR)

This is the actual amount in pounds per year of the toxic emitted reported as a VOC or PM10 at the emission point described. All figures should be rounded to the nearest hundredth of a pound.

ACTUAL EMITTED REPORTED AS VOC OR PM10 =

(UNCONTROLLED EMISSIONS REPORTED AS VOC OR PM10) X (100 – CONTROL EFFICIENCY)/100

10) ACTUAL EMISSIONS REPORTED AS HAPs (LBS/YR)

This is the actual amount in pounds per year of the toxic emitted reported as a HAP at the emission point described. All figures should be rounded to the nearest hundredth of a pound.

ACTUAL EMITTED REPORTED AS HAPs =

(UNCONTROLLED EMISSIONS REPORTED AS HAPs) X (100 – CONTROL EFFICIENCY)/100

11) HAP EMISSION FACTOR

Divide the HAP EMISSIONS NOT REPORTED total (from column 6) by the Annual Throughput and enter this number in the **HAP EMISSIONS FACTOR** box of this form and the corresponding box in Column 7 of Form 2.0. (The annual throughput component in the above calculation will be found in Block 4 of Form 2.0). This is the uncontrolled emission factor. An overall HAP control efficiency will be listed on Form 2.0 if applicable.

NOTE: If you are reporting different control efficiencies for different HAPs on Form 2.T, then the following formula should be used for Overall Control Efficiency on Form 2.0 (block 9 of Form 2.0):

100 X [1- (Sum of Actual Emissions Reported as HAPs on Form 2.T) / (Throughput X Uncontrolled HAP Emission Factor)]

SECTION 112 HAZARDOUS AIR POLLUTANTS 5/4/99 update

The HAPs (Hazardous Air Pollutants) are separated into two categories based on the toxicity of each chemical. Each category has a different emission point reporting level. If a facility emits more than the reporting level for at least one HAP from a single emission point then the amount used and emitted must be reported on the Emission Inventory Questionnaire. NOTE: Criteria pollutant emissions should also be included when checking on the 200 pound reporting level.

Emission reporting levels are: Category 1 HAPs - 20 Lbs/Yr;
Category 2 HAPs - 200 Lbs/Yr

Chemical Abstracts Service Number	Pollutant	VOC	PM
CATEGORY 1 HAZARDOUS AIR POLLUTANTS			
20-01-9	Arsenic Compounds (inorganic including arsine)	No	Yes
1332-21-4	Asbestos	No	Yes
20-06-4	Chromium Compounds	No	Yes
302-01-2	Hydrazine	Yes	No
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin	No	No
CATEGORY 2 HAZARDOUS AIR POLLUTANTS			
75-07-0	Acetaldehyde	Yes	No
60-35-5	Acetamide	Yes	No
75-05-8	Acetonitrile	No	No
98-86-2	Acetophenone	Yes	No
53-96-3	2-Acetylaminofluorene	Yes	No
107-02-8	Acrolein	Yes	No
79-06-1	Acrylamide	Yes	No
79-10-7	Acrylic acid	Yes	No
107-13-1	Acrylonitrile	Yes	No
107-05-1	Allyl chloride	Yes	No
92-67-1	4-Aminobiphenyl	Yes	No
62-53-3	Aniline	Yes	No
90-04-0	o-Anisidine	Yes	No
71-43-2	Benzene (including benzene from gasoline)	Yes	No
92-87-5	Benzidine	Yes	No
98-07-7	Benzotrichloride	Yes	No
100-44-7	Benzyl chloride	Yes	No
92-52-4	Biphenyl	Yes	No
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	Yes	No
542-88-1	Bis(chloromethyl) ether	Yes	No
75-25-2	Bromoform	No	No
106-99-0	1,3-Butadiene	Yes	No
156-62-7	Calcium cyanamide	Yes	No
133-06-2	Captan	Yes	No

63-25-2	Carbaryl	Yes	No
75-15-0	Carbon disulfide	Yes	No
56-23-5	Carbon tetrachloride	Yes	No
463-58-1	Carbonyl sulfide	Yes	No
120-80-9	Catechol	Yes	No
133-90-4	Chloramben	Yes	No
57-74-9	Chlordane	Yes	No
7782-50-5	Chlorine	No	No
79-11-8	Chloroacetic acid	Yes	No
532-27-4	2-Chloroacetophenone	Yes	No
108-90-7	Chlorobenzene	Yes	No
510-15-6	Chlorobenzilate	Yes	No
67-66-3	Chloroform	No	No
107-30-2	Chloromethyl methyl ether	Yes	No
126-99-8	Chloroprene	Yes	No
1319-77-3	Cresol/Cresylic acid (mixed isomers)	Yes	No
95-48-7	o-Cresol	Yes	No
108-39-4	m-Cresol	Yes	No
106-44-5	p-Cresol	Yes	No
98-82-8	Cumene	Yes	No
94-75-7	2,4-D (2,4-Dichlorophenoxyacetic Acid) (including salts and esters)	Yes	No
72-55-9	DDE (1,1-dichloro-2,2-bis(p-chlorophenyl) ethylene)	Yes	No
334-88-3	Diazomethane	Yes	No
132-64-9	Dibenzofuran	Yes	No
96-12-8	1,2-Dibromo-3-chloropropane	Yes	No
84-74-2	Dibutyl phthalate	Yes	No
106-46-7	1,4-Dichlorobenzene	Yes	No
91-94-1	3,3'-Dichlorobenzidine	Yes	No
111-44-4	Dichloroethyl ether (Bis[2-chloroethyl]ether)	Yes	No
542-75-6	1,3-Dichloropropene	Yes	No
62-73-7	Dichlorvos	Yes	No
111-42-2	Diethanolamine	Yes	No
64-67-5	Diethyl sulfate	Yes	No
119-90-4	3,3'-Dimethoxybenzidine	Yes	No
60-11-7	4-Dimethylaminoazobenzene	Yes	No
121-69-7	N,N-Dimethylaniline	Yes	No
119-93-7	3,3'-Dimethylbenzidine	Yes	No
79-44-7	Dimethylcarbamoyl chloride	Yes	No
68-12-2	N,N-Dimethylformamide	Yes	No
57-14-7	1,1-Dimethylhydrazine	Yes	No
131-11-3	Dimethyl phthalate	Yes	No
77-78-1	Dimethyl sulfate	Yes	No
534-52-1	4,6-Dinitro-o-cresol	Yes	No

	(including salts)		
51-28-5	2,4-Dinitrophenol	Yes	No
121-14-2	2,4-Dinitrotoluene	Yes	No
123-91-1	1,4-Dioxane (1,4-Diethyleneoxide)	Yes	No
122-66-7	1,2-Diphenylhydrazine	Yes	No
106-89-8	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	Yes	No
106-88-7	1,2-Epoxybutane	Yes	No
140-88-5	Ethyl acrylate	Yes	No
100-41-4	Ethylbenzene	Yes	No
51-79-6	Ethyl carbamate (Urethane)	Yes	No
75-00-3	Ethyl chloride (Chloroethane)	Yes	No
106-93-4	Ethylene dibromide (Dibromoethane)	No	No
107-06-2	Ethylene dichloride (1,2-Dichloroethane)	No	No
107-21-1	Ethylene glycol	Yes	No
151-56-4	Ethyleneimine (Aziridine)	Yes	No
75-21-8	Ethylene oxide	Yes	No
96-45-7	Ethylene thiourea	Yes	No
75-34-3	Ethylidene dichloride (1,1-Dichloroethane)	Yes	No
50-00-0	Formaldehyde	Yes	No
76-44-8	Heptachlor	Yes	No
118-74-1	Hexachlorobenzene	Yes	No
87-68-3	Hexachlorobutadiene	Yes	No
58-89-9	1,2,3,4,5,6-Hexachlorocyclohexane (all stereo isomers, including lindane)	Yes	No
77-47-4	Hexachlorocyclopentadiene	Yes	No
67-72-1	Hexachloroethane	Yes	No
822-06-0	Hexamethylene diisocyanate	Yes	No
680-31-9	Hexamethylphosphoramide	Yes	No
110-54-3	Hexane	Yes	No
7647-01-0	Hydrochloric acid (Hydrogen chloride)	No	No
7664-39-3	Hydrogen fluoride (Hydrofluoric acid)	No	No
123-31-9	Hydroquinone	Yes	No
78-59-1	Isophorone	Yes	No
108-31-6	Maleic anhydride	Yes	No
67-56-1	Methanol	Yes	No
72-43-5	Methoxychlor	Yes	No
74-83-9	Methyl bromide (Bromomethane)	No	No
74-87-3	Methyl chloride	No	No

	(Chloromethane)		
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	No	No
78-93-3	Methyl ethyl ketone (2-Butanone)	Yes	No
60-34-4	Methylhydrazine	Yes	No
74-88-4	Methyl iodide (Iodomethane)	Yes	No
108-10-1	Methyl isobutyl ketone (Hexone)	Yes	No
624-83-9	Methyl isocyanate	Yes	No
80-62-6	Methyl methacrylate	Yes	No
1634-04-4	Methyl tert-butyl ether	Yes	No
101-14-4	4,4'-Methylenebis(2-chloroaniline)	Yes	No
75-09-2	Methylene chloride (Dichloromethane)	No	No
101-68-8	4,4'-Methylenediphenyl diisocyanate (MDI)	Yes	No
101-77-9	4,4'-Methylenedianiline	Yes	No
91-20-3	Naphthalene	Yes	No
98-95-3	Nitrobenzene	Yes	No
92-93-3	4-Nitrobiphenyl	Yes	No
100-02-7	4-Nitrophenol	Yes	No
79-46-9	2-Nitropropane	Yes	No
684-93-5	N-Nitroso-N-methylurea	Yes	No
62-75-9	N-Nitrosodimethylamine	Yes	No
59-89-2	N-Nitrosomorpholine	Yes	No
56-38-2	Parathion	Yes	No
82-68-8	Pentachloronitrobenzene (Quintobenzene)	Yes	No
87-86-5	Pentachlorophenol	Yes	No
108-95-2	Phenol	Yes	No
106-50-3	p-Phenylenediamine	Yes	No
75-44-5	Phosgene	Yes	No
7803-51-2	Phosphine	No	No
7723-14-0	Phosphorus	No	No
85-44-9	Phthalic anhydride	Yes	No
1336-36-3	Polychlorinated biphenyls (Aroclors)	Yes	No
1120-71-4	1,3-Propane sultone	Yes	No
57-57-8	beta-Propiolactone	Yes	No
123-38-6	Propionaldehyde	Yes	No
114-26-1	Propoxur (Baygon)	Yes	No
78-87-5	Propylene dichloride (1,2-Dichloropropane)	Yes	No
75-56-9	Propylene oxide	Yes	No
75-55-8	1,2-Propylenimine (2-Methylaziridine)	Yes	No

91-22-5	Quinoline	Yes	No
106-51-4	Quinone (p-Benzoquinone)	Yes	No
100-42-5	Styrene	Yes	No
96-09-3	Styrene oxide	Yes	No
79-34-5	1,1,2,2-Tetrachloroethane	Yes	No
127-18-4	Tetrachloroethylene (Perchloroethylene)	No	No
7550-45-0	Titanium tetrachloride	No	No
108-88-3	Toluene	Yes	No
95-80-7	Toluene-2,4-diamine	Yes	No
584-84-9	2,4-Toluene diisocyanate	Yes	No
95-53-4	o-Toluidine	Yes	No
8001-35-2	Toxaphene (chlorinated camphene)	Yes	No
120-82-1	1,2,4-Trichlorobenzene	Yes	No
79-00-5	1,1,2-Trichloroethane	Yes	No
79-01-6	Trichloroethylene	Yes	No
95-95-4	2,4,5-Trichlorophenol	Yes	No
88-06-2	2,4,6-Trichlorophenol	Yes	No
121-44-8	Triethylamine	Yes	No
1582-09-8	Trifluralin	Yes	No
540-84-1	2,2,4-Trimethylpentane	Yes	No
108-05-4	Vinyl acetate	Yes	No
593-60-2	Vinyl bromide	Yes	No
75-01-4	Vinyl chloride	Yes	No
75-35-4	Vinylidene chloride (1,1-Dichloroethylene)	Yes	No
1330-20-7	Xylenes (mixed isomers)	Yes	No
95-47-6	o-Xylene	Yes	No
108-38-3	m-Xylene	Yes	No
106-42-3	p-Xylene	Yes	No
20-00-8	Antimony Compounds	No	Yes
20-03-1	Beryllium Compounds	No	Yes
20-04-2	Cadmium Compounds	No	Yes
20-07-5	Cobalt Compounds	No	Yes
8007-45-2	Coke Oven Emissions	No	No
20-09-7	Cyanide Compounds1	No	No
20-10-0	Glycol ethers2	Yes	No
20-11-1	Lead Compounds	No	Yes
20-12-2	Manganese Compounds	No	Yes
20-13-3	Mercury Compounds (Alkyl&Aryl)	Yes	No
20-13-3	Mercury Compounds (Inorganic)	No	No
TP14	Fine mineral fibers3	No	Yes
20-14-4	Nickel Compounds	No	Yes
TP15	Polycyclic Organic Matter4	Yes	No
TP16	Radionuclides (including radon)5	No	Yes
20-16-6	Selenium Compounds	No	Yes

NOTE: For all listings above which contain the word "compounds" and for glycol ethers, the following applies: Unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named chemical (i.e., antimony, arsenic, etc.) as part of that chemical's infrastructure.

1--X'CN where X = H' or any other group where a formal dissociation may occur. For example, KCN or Ca(CN)2.

2--On January 12, 1999 (FR64:1780), EPA proposed to modify the definition of glycol ethers to exclude surfactant alcohol ethoxylates and their derivatives (SAED). This proposal was based on EPA's finding that emissions, ambient concentrations, bioaccumulation, or deposition of SAED may not reasonably be anticipated to cause adverse human health or environmental effects. EPA also proposed to make conforming changes in the definition of glycol ethers with respect to the designation of hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The proposal reads as follows:

"The definition of the glycol ethers category of hazardous air pollutants, as established by 42 U.S.C. 7412(b)(1) includes mono- and di-ethers of ethylene glycol, diethylene glycol, and triethylene glycol R-(OCH2CH2)n-OR'

Where:

n= 1, 2, or 3
R= alkyl C7 or less, or phenyl or alkyl substituted phenyl
R'= H, or alkyl C7 or less, or carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate."

3 (Under Review)

4 (Under Review)

5A type of atom which spontaneously undergoes radioactive decay.

INSTRUCTIONS

FORM 2.0Z OZONE SEASON INFORMATION

This is a **REQUIRED** form only for facilities located within the St. Louis Ozone Nonattainment Area and with volatile organic compounds (VOC), nitrogen oxide compounds (NO_x) or carbon monoxide (CO) emissions of ten or more tons per year. The applicable area consists of St. Louis City and Franklin, Jefferson, St. Charles and St. Louis counties.

The Ozone Season Information Form is designed for reporting data specific to the pollutants responsible for ground-level ozone formation. The ozone season occurs from April through October with a peak from June 1 through August 31. **The information should be reported only for the peak ozone season.** The Air Pollution Control Program will use information reported on this form to determine overall VOC, NO_x and CO emission rates for stationary sources within the nonattainment area. Space is allocated on each Form 2.0Z to report VOC, NO_x and CO emissions from as many as three different emission points.

Complete **Facility Name, FIPS County No., Plant No., and Year of Data.**
See Form 1.0 instructions, page 1.0-1.

1. OPERATING RATE/SCHEDULE

Point Number: This number uniquely identifies each specific VOC-, NO_x- or CO-producing process. The identification should match the point number entered on Form 1.1, Process Flow Diagram; Form 1.2, Summary of Emission Points; and Form 2.0, Emission Point Information.

AIRS ID-Pt and Seg No.: Same as on Form 2.0

SCC (Source Classification Code): This code identifies the process or combustion type associated with an emission point.

Daily Ozone Season Throughput: This value is the amount of material processed on an average day during the **peak ozone season**. For example, the throughput for a spray painting operation might be a number of gallons or pounds of paint used or applied.

Units: These are the units for the daily ozone season throughput. For the painting operation example, the units might be gallons or pounds or tons. The units should be consistent with emission factor units. If the emission factor units are pounds per ton of paint applied, then the throughput units should be in tons of paint applied per day.

Days/Week During Peak Ozone Season: This value is the number of typical days per week that this specific piece of equipment or process is in operation during June, July and August.

Weeks of Operation During Peak Ozone Season: This value is the number of weeks that this specific piece of equipment or process is in operation during June, July and August. The maximum value is thirteen weeks.

Start Time on Typical Ozone Season Day: This value is the time of day that this specific piece of equipment or process **begins** operation on a typical day during the ozone season.

End Time on Typical Ozone Season Day: This value is the time of day that this specific piece of equipment or process **ceases** operation on a typical day during the ozone season.

2. EMISSIONS CALCULATIONS

Emission Factor (pounds/unit): This value is the factor that must be provided for each pollutant released (VOC, NO_x and CO) at the emission point described. The emission factor must be the same as the factor on Form 2.0 for this point.

Overall Control Efficiency (%): Enter the overall control device efficiency for the appropriate pollutant. Section 3 of the instructions for Form 2.0, Emission Point Information, explains what is required of this entry. The overall control efficiency must be the same as on form 2.0 for this point.

Actual Emissions (pounds/day): Actual emissions are determined by multiplying the emission factor for the specific pollutant (VOC, NO_x, or CO) by the daily peak ozone season throughput and factoring out any pollutants removed by a control device. The resulting number, in pounds per day, is the actual emission for that point for the specific pollutant. The applicable formula and associated directions are discussed thoroughly in the instructions to Form 2.0, Emission Point Information. The discussion is found under the heading Emission Calculations. There is one distinction to note: Form 2.0 asks for **annual** throughput, not **daily peak ozone season** throughput.

INSTRUCTIONS
FORM 2.1 FUEL COMBUSTION WORKSHEET

This form is **REQUIRED** for all facilities with on-site combustion equipment units whose total heat capacity equals or exceeds ten million BTU per hour. Facilities with smaller combustion units should use this form when grouping these combustion units. The Maximum Hourly Design Rates (MHDR) of all units, no matter what the capacity, must be reported. The MHDR calculations, including those for smaller units, must be documented. The calculations for smaller units may be displayed on Form 2.1 or on a separate sheet of paper.

A separate Form 2.0, Emission Point Information, and Form 2.1 should be completed for **each type of fuel** used (or capable to use) with the combustion equipment at this emission point even if **no annual throughput.** A **separate** Form 2.0 and Form 2.1should also be completed for each piece of combustion equipment with a heat input capacity more than **10** million BTU per hour.

Smaller capacity BTU combustion equipment (less than 10 million BTU/hour) should be grouped together if all the equipment is within the same Source Classification Code (SCC) category. For example, two similar combustion units that both use natural gas as a fuel may be grouped.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**
See Form 1.0 instructions, page 1.0-1.

1) COMBUSTION EQUIPMENT INFORMATION

Point Number: This number is the unique identification number for each specific piece of combustion equipment. This identification number must match the point number entered on Form 1.1, Process Flow Diagram; Form 1.2, Summary of Emission Points and Form 2.0, Emission Point Information.

AIRS ID-Pt and Seg. No: See Form 2.0 instructions.

SCC Number: List the Source Classification Code (SCC) that identifies the type of fuel unit and/or the fuel used at this emission point. An SCC is **REQUIRED** for each emission point.

Equipment Description: Please describe the combustion equipment associated with the emission point. Examples of a combustion unit include a boiler, annealing furnace, drying oven, bake oven, burn-off oven, incinerator, after burner, catalytic incinerator or thermal oxidizer.

Year Equipment Put in Service: Enter the year the combustion equipment was installed at the facility if known.

Coal Firing Code No.: This entry is required only for coal-fired combustion equipment. Enter the number corresponding to the firing method for the combustion equipment. A firing method code list is provided in Block 1 on this form.

Maximum Design Rate: This figure is the maximum hourly heat input capacity for each piece of equipment in million BTU per hour.

Sum of Total Maximum Hourly Design Rates: This figure is the total of the Maximum Design Rates for all combustion equipment.

Combustion Equipment Use: Check the box that best applies to how the combustion equipment is being used.

Combustion Equipment Category: This entry is required only for coal-fired equipment. Check the box that best applies to how the fuel is being introduced into the combustion chamber.

2) FUEL INFORMATION

Fuel Type: Check only one box for the type of combustion equipment being used. A separate Form 2.0 and Form 2.1 must be used for each different type of fuel that is being used at this emission point.

NOTE: If refuse or trade wastes are being burned, then Block 1, Equipment Information, from Form 2.2, Incinerator Worksheet, also must be completed for this emission point.

Fuel Identifier: Describe the fuel used with the combustion equipment for this emission point. Coal users must list each grade of coal used when different grades are burned.

Annual Throughput: Specify the total amount of fuel burned during the year using the combustion equipment at this emission point. The Annual Throughput figure must be expressed in the units described below.

Annual Throughput Units: The annual throughput units that apply to the combustion equipment for this emission point will depend on the SCC used. The **Annual Throughput Units MUST** correspond to the SCC Emission Factor Unit that is being used for the combustion equipment and fuel type for this emission point. The units must be expressed in tons for coal, thousands of gallons for oil or LPG, or million cubic feet for natural gas.

NOTE TO NATURAL GAS USERS: Be sure to review the comments in the Glossary regarding MMCF and MCF.

Percent Sulfur by Weight as Received: (This entry is required **ONLY** if there is a Sulfur Flag (S) accompanying the SCC used on this point. For example, there are no flags for natural gas: do not complete this entry for that fuel. However, since there are flags for propane and coal, complete this entry for those fuels.) The value for the percentage of sulfur must be entered as the weight of the sulfur in the fuel as compared with the weight of the fuel when the facility RECEIVED it. The percentage of sulfur value for coal, oil and LPG/Propane must agree with the statement from your supplier. (The default value for the sulfur content of propane is .00002%.)

If more than one shipment of the same fuel type was received and used during the year, the percentage of sulfur must be calculated as a weighted average, using the percentage sulfur and the amount of each different fuel shipment used during the year. See the Weighted Averages section for a discussion on how to calculate a weighted average on the percent sulfur.

Percent Ash by Weight as Received: (This entry is required **ONLY** if there is an Ash Flag (A) accompanying the SCC used at this point.) The value for the percentage of ash must be entered as the weight of the ash in the fuel compared with the weight of the fuel when it was

RECEIVED by the facility. The percentage of ash value for coal and oil must agree with the statement from your supplier. If more than one shipment of the same fuel type was received and used during the year, the percentage of ash must be calculated as a weighted average, using the percentage ash and the amount of each different fuel shipment used during the year. See the Weighted Averages section for a discussion on how to calculate a weighted average on the percent ash.

Heat Content: (See the table, "Typical Parameters of Various Fuels," at the end of the instructions for this worksheet. This table lists the Heat Content of commonly used fuels.) The value entered should be calculated as the BTU value for the specific fuel multiplied by the amount of fuel in the SCC fuel unit. The fuel units used for the Heat Content of this fuel **must agree** with Annual Throughput **SCC units** used for this fuel type. The SCC unit for coal is tons, thousands of gallons for oil or LPG, and million cubic feet (MMCF) for natural gas.

Example: For bituminous coal, multiply the heating value of 13,000 BTU/lb by 2,000 to equate the heat content to the SCC unit of tons for coal. For natural gas, multiply the heating value of 1050 BTU/SCF (standard cubic foot) by 1,000,000 to match the SCC unit of million cubic feet. For propane, multiply 94,000 BTU/gallon by 1,000 to equate heat content to the SCC unit of 1,000 gallons (94,000 BTU/gal x 1,000 = 94,000,000 BTU/1,000 gallons).

Fuel Totals and Weighted Averages: Enter the value for the total Annual Throughput used during the year. The value for Percent Sulfur and/or Percent Ash should be entered as a weighted average(s) for the specific fuel type being used. Use the Calculation below to determine the Weighted Averages. The value entered for the Heat Content should be an average of all the heat contents.

Calculation of Weighted Average of the Percentage of Ash or Sulfur.

A. Multiply each individual Annual Throughput of the fuel by the corresponding Percentage of Ash or Sulfur in that fuel.
B. Total the above calculations (Throughput x Ash/Sulfur).
C. Total all the Annual Throughputs for the specified fuel.
D. Divide the total [Throughput x Ash/Sulfur] figure by the total annual throughput figure. The value obtained is the weighted average for the Ash/Sulfur percentage.

3) **Calculation of Maximum Hourly Design Rate:** Convert the Heat Content units from BTU/SCC Fuel Unit to Millions of BTU/SCC Fuel Unit by dividing the BTU figure by 1,000,000.

> Example: During the heat content discussion, we noted that the heat content of propane is 94,000,000 BTU per 1,000 gallons. The following calculation converts to millions of BTU/SCC unit: 94,000,000 ÷ 1,000,000 = 94 million BTU/ 1,000 gallons.

Total Maximum Hourly Design Rate: This entry is the amount of fuel that would be used if the combustion equipment were being continuously operated at 100 percent of its rated capacity for one hour. The Maximum Hourly Design Rate should be calculated by dividing the Total Maximum Design Rate expressed in millions of BTU per hour (MM BTU/Hr) by the Heat Content expressed in millions of BTU per fuel unit (MM BTU/fuel unit).

Example: A boiler burning propane has a total maximum design rate of 12 million BTU per hour. Using the results of the above example, the maximum hourly design rate = 12 MM BTU/hr ÷ 94 MM BTU/1,000 gallons = .1277 M gallons/hr.

Example: A boiler burning natural gas fuel has a Total Maximum Design Rate of 12 million BTU per hour (12 MM BTU/hr). From the heat content table, observe that the heat content of natural gas is 1,050 BTU/cubic ft (SCF). This equates to 1,050 million BTU per million cubic feet (MMCF). The Maximum Hourly Design Rate is calculated as follows:

Maximum Hourly Design Rate
= 12 MM BTU/Hr ÷ 1,050 MM BTU/MM Cubic Feet (CF)
= 0.0114 MM CF/hour

The value 0.0114 MMCF per hour would then be entered in the total maximum hourly design rate box in Block 3 on Form 2.1.

ENTER THE FOLLOWING ON FORM 2.0, EMISSION POINT INFORMATION, that is associated with this Form 2.1.

Block 4 - The Total **Annual Throughput**, Annual Throughput **Units** and the **Maximum Hourly Design Rate** should be entered in the appropriate boxes.

Block 8 - When appropriate, the weighted average values for the **Sulfur Percent** and/or the **Ash Percent** should also be entered in the appropriate box(s).

TYPICAL PARAMETERS OF VARIOUS FUELS[a]

Type Of Fuel	Heating Value		Sulfur % (by weight)	Ash % (by weight)
	kcal	Btu		
Solid Fuels				
Bituminous Coal	7,200/kg	13,000/lb	0.6-5.4	4-20
Anthracite Coal	6,810/kg	12,300/lb	0.5-1.0	7.0-16.0
Lignite (@ 35% moisture)	3,990/kg	7,200/lb	0.7	6.2
Wood (@ 40% moisture)	2,880/kg	5,200/lb	N	1-3
Bagasse (@ 50% moisture)	2,220/kg	4,000/lb	N	1-2
Bark (@ 50% moisture)	2,492/kg	4,500/lb	N	1-3[b]
Coke, Byproduct	7,380/kg	13,300/lb	0.5-1.0	0.5-5.0
Liquid Fuels				
Residual Oil	$9.98 \times 10^6/m^3$	150,000/gal	0.5-4.0	0.05-0.1
Distillate Oil	$9.30 \times 10^6/m^3$	140,000/gal	0.2-1.0	N
Diesel	$9.12 \times 10^6/m^3$	137,000/gal	0.4	N
Gasoline	$8.62 \times 10^6/m^3$	130,000/gal	0.03-0.04	N
Kerosene	$8.32 \times 10^6/m^3$	135,000/gal	0.02-0.05	N
Liquid Petroleum Gas	$6.25 \times 10^6/m^3$	94,000/gal	N	N
Gaseous Fuels				
Natural Gas	$9,341/m^3$	1,050/SCF	N	N
Coke Oven Gas	$5,249/m^3$	590/SCF	0.5-2.0	N
Blast Furnace Gas	$890/m^3$	100/SCF	N	N

[a] N = negligible.
[b] Ash content may be considerably higher when sand, dirt, etc., are present.

INSTRUCTIONS
FORM 2.2 INCINERATOR WORKSHEET

This form is **REQUIRED** only if a facility has an incinerator at the facility site.

If the SCC Emission Factor is being used, only Block 1 on Form 2.2 needs to be completed for each specific incinerator. If SCC Emission Factors are not being used, completely fill out this document.

Form 2.2 should be used to determine the total Annual Throughput of material burned in this specific incinerator during the year. If different materials are burned in the same incinerator during the year, the total Annual Throughput should be for all materials burned. A separate Form 2.0 should be used to calculate the emissions from each incinerator. The Emission Factor(s) used to calculate the Actual Emissions for this incinerator may come from the SCC Listing or from Form 2.9, Stack Test/Continuous Emission Monitoring Worksheet.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**
See Form 1.0 Instructions, page 1.0-1.

1) EQUIPMENT INFORMATION

Point Number: This is the unique identification number for each specific incinerator. This identification must match the point number entered on Form 1.1, Process Flow Diagram; Form 1.2, Summary of Emission Points and Form 2.0, Emission Point Information.

AIRS ID-Pt and Seg. No: To be completed by the APCP.

Make/Model: Enter make/model number for the type of incinerator associated with this emission point.

Serial Number: Enter the serial number for the incinerator associated with this emission point.

Incinerator Use: Check the appropriate box for the type of industry using the incinerator. These boxes categorize the industries in which incinerators are used according to the SCC descriptions.

Equipment Type: Check the appropriate boxes for the type of operation the incinerator is performing. These boxes use SCC descriptions to categorize industries in which incinerators are used.

Number of Chambers Not Including Stack: Enter the number of chambers for your specific incinerator. The figure provided should include the primary combustion chamber, along with any secondary, tertiary or other chambers.

Secondary Chamber Temperature (Deg F): Enter the temperature of the secondary combustion chamber in degrees Fahrenheit for the gas exiting this chamber.

Maximum Hourly Design Rate: This figure is the manufacturer's design rate or the design rate obtained from a stack test for the Maximum Hourly Capacity of the incinerator. The capacity is measured as the maximum amount of waste that can be loaded (charged) into the incinerator every hour.

Units/Hour: The units for the Maximum Hourly Design Rate are the same as the units for the Annual Throughput, but they should be expressed as Throughput Units per hour.

SCC Number and Units: A SCC number may be found in the SCC Listing. The specific SCC number to use with this emission point is determined by the type of incinerator and how it is being used. The units are determined by the emission method being used at this point.

2) WASTE INFORMATION AND THROUGHPUTS

Process Waste Type: List each different type of material burned in the incinerator during the year.

Heat Content: The Heat Content value is the number of BTU released from burning each unit of waste material. For some common waste materials, the heat content figure and its units may be found in Table I. If more than one type of material is burned during the year, calculate an average heat content value.

Annual Throughput: This figure is the amount of each specific material incinerated in this incinerator during the entire year.

Units: The annual throughput units figure for incinerators is usually expressed in tons per year.

Total Annual Throughput: This figure is the total amount of all materials burned in the incinerator during the year. If the individual Annual Throughput is in pounds/year, make sure to divide the total annual throughput by 2,000 to calculate the figure in tons per year and enter that number in the **Tons/Year** box.

ENTER THE FOLLOWING ON FORM 2.0, EMISSION POINT INFORMATION:

Block 4 - Enter the Total Annual Throughput (Tons/Year);
Maximum Hourly Design Rate figure; and
Corresponding Units in the appropriate boxes.

TABLE I CLASSIFICATION OF WASTES

Waste Classification	Waste Description	BTU/Pound
Type O	A mixture of highly combustible waste, primarily paper, cardboard, wood, boxes and combustible floor sweepings; mixtures may contain up to 10% by volume of plastic bags, coated paper, laminated paper, treated corrugated cardboard, oily rags and plastic rubber scraps. Commercial and industrial sources.	8500
Type 1	A mixture of combustible waste such as paper, cardboard, woodscrap, foliage, floor sweepings and up to 20% cafeteria waste. Commercial and industrial sources.	6500
Type 2	Rubbish and garbage. Residential sources.	4300
Type 3	Animal and vegetation waste from restaurants, cafeterias, hotels, etc. Institutional, club and commercial sources.	2500
Type 4	Human and animal remains consisting of carcasses, organs and solid tissue wastes from farms, laboratories and animal pounds.	1000
Type 5	Medical waste including sharps, pathological, surgical and associated infectious waste materials.	10,000
Type 6	Department store waste.	7800
Type 7	School waste with lunch programs.	8000
Type 8	Supermarket waste.	7200
Type 9	Other wastes not described here or which have variable or unknown BTU content that must be verified.	

INSTRUCTIONS
FORM 2.3 VOC PROCESS MASS-BALANCE WORKSHEET

This is a **REQUIRED FORM** if a facility is using mass balance to calculate a volatile organic compound (VOC) emission factor. An emission factor calculated by mass balance will usually be more accurate for a specific process at your facility than using the standard U.S. Environmental Protection Agency (EPA) emission factor. You still need to associate the process with a Source Classification Code (SCC) even if you calculate your own emission factor.

A separate Form 2.0, Emission Point Information, and Form 2.3, VOC Process Mass-Balance Worksheet, should be completed for each different process that emits VOCs within your facility. Examples of VOC operations include degreasing, spray painting, adhesive application, flexographic or gravure printing, and equipment cleaning. Each VOC process will have a separate SCC and calculations need to be on separate worksheets. Additional VOC Process Mass-Balance Worksheet forms may be needed to show different VOC material types associated with the same emission point.

Please maintain a copy of the Material Safety Data Sheet (MSDS) for each of the VOC materials listed on Form 2.3.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**
See Form 1.0 instructions, page 1.0-1.

Point Number: This is the unique identification number for each specific VOC process. This identification must match the point number entered on Form 1.1, Process Flow Diagram, Form 1.2, Summary of Emission Points and Form 2.0, Emission Point Information.

AIRS ID-Pt and Seg No.: To be completed by the APCP.

Source Classification Code (SCC): List the code that identifies the type of process associated with this emission point.

1) TOTAL ANNUAL THROUGHPUT AND TOTAL POUNDS OF VOLATILE ORGANIC COMPOUNDS

Application Method: This application method uniquely identifies the operation or VOC process that is producing the VOC emissions for this emission point. Examples include spray, roller, dip or electrostatic.

Material Type: This box is used to uniquely identify the material being used. Examples include primers, paints, clear coats, inks, thinners and solvents. For primers, paints and inks, different colors of these materials may be grouped together into the same emission point if the percent VOC in each material is the same.

Annual Throughput (SCC Units/Yr) [A]: This figure is the total amount of a specific material type used at this emission point during the year. This figure must be expressed in the appropriate SCC units for this emission point. Material that is not used and is returned to the manufacturer as "out of specification" should not be included in this Annual Throughput figure.

Percent by Weight VOC in Material [B]: This value of the percent of VOCs in the material (by weight) should be available from the MSDS provided by the supplier for the specific material associated with this emission point. You may leave this box blank if the Pounds of VOC per Unit **[D]** has been completed for this material. If SCC unit is **tons,** then Percent by Weight of VOC would be in tons, not gallons.

Density [C]: The value for the material should be available from the MSDS provided by the supplier for the specific material associated with this emission point. If the specific gravity is given on the MSDS, multiply the specific gravity by 8.34 to obtain the density expressed in pounds of material per gallon of liquid. If the SCC unit is **tons**, then density would always be 2000 pounds.

Lbs. of VOC Per Unit [D]: The value for this material should be available from the MSDS provided by the supplier for the specific material associated with this emission point. If the Pounds of VOC per Unit figures are not known, then they can be calculated by multiplying the Percent VOC by Weight **[B]** in the material by the Density **[C]** of that material. If the SCC unit is **tons**, then Lbs. Of VOC Per Unit would be in tons, not gallons.

VOC (Pounds/Year) [E]: This figure is the total amount of VOCs released for the specific material associated with this emission point. The VOC figure can be calculated by multiplying the Annual Throughput **[A]** for each material by the Pounds of VOC per unit **[D]** for the same material.

Total Annual Throughput: This figure must be expressed in the same units as the SCC emission factor units used with the specific process for this emission point. This figure should be entered in the appropriate box in Block 4 of the Form 2.0, Emission Point Information, that is associated with this emission point.

Total VOC(Pounds/Year): This figure is the total of the VOC amounts calculated in the above boxes.

2) CALCULATION OF VOC RECOVERED

Material Shipped as Hazardous Waste: This figure is the total amount of material listed on the Hazardous Waste Manifest as having been shipped from this particular VOC process during the year. This figure should be expressed as the total pounds of waste shipped for this emission point. Waste materials that were not included in the Annual Throughput figure calculated above should not be included in the VOC calculation for this block. **Documentation must be provided for the amount of material shipped.**

Percent VOC Content of Waste: This figure is the weighted average for the VOC content of all shipments of hazardous waste shipped from this emission point. If specific test data is not available on the VOC content of the waste, an estimate for this percent VOC figure may be provided with any supporting documentation available. **Supporting documentation must be provided for the percent VOC content.**

Pounds of VOC Recovered: This figure is the amount of VOC recovered or shipped as a liquid hazardous waste from the process associated with this emission point.

3) CALCULATION OF VOC EMITTED PRIOR TO CONTROL

Calculate the **Pounds of VOC Emitted Prior to any Control** devices by taking the Total Pounds of VOC figure and subtracting the Pounds of VOC Recovered. The result of this subtraction should be the total amount of VOCs emitted from the VOC process during the year.

3) (Continued)

INTERIM POLICY AS OF FEBRUARY 11, 1999:

Emissions from inks used by Non-heatset, Offset Lithographic Printers should be adjusted by multiplying "Lbs of VOC Emitted Prior to Control" by 5%. This calculation should be noted on item [3]. The EPA method 24 may also be used to calculate a percentage in lieu of the 5% value. Calculations for determining this percentage must be submitted with the Form 2.3. Note that either the percentage calculated using EPA method 24, or the 5% value may be used, but not both.

4) BACK CALCULATION OF EMISSION FACTOR

The VOC Emission Factor should be calculated by taking the Pounds of VOCs Emitted Prior to Control Equipment and dividing by the Total Annual Throughput. (Annual Throughput must be expressed in terms of SCC units.)

Emission Factor: This figure is the value that the equation described above calculated. This Emission Factor should be entered in the VOC Emission Factor box in Block 7 on the Form 2.0, Emission Point Information, that is associated with this emission point.

Emission Factor Units: The units entered in this box should be the same as the SCC units for this emission point. Some common units for VOCs are lbs/gallon and lbs/ton.

INSTRUCTIONS

FORM 2.4 PETROLEUM LIQUID LOADING WORKSHEET

This form is **REQUIRED** only if a facility needs to calculate the volatile organic compound (VOC) emission factor for petroleum liquid loading into tank trucks, rail cars or barges.

If the Source Classification Code (SCC) emission factor is being used, Block 2, CHEMICAL INFORMATION, on Form 2.4 should be completed for each petroleum liquid loading operation. If SCC emission factors are not being used, you need to fill out this document completely.

NOTE: Tables, Figures and other attachments are not included with these instructions. Please refer to EPA Manual AP-42, Section 5 and 7, or contact the Air Pollution Control Program at (573) 751-4817.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**
See Form 1.0 instructions, page 1.0-1.

1) LOADING INFORMATION

Point Number: This number is the unique identification number for each specific petroleum loading station. This identification number must match the point number entered on Form 1.1, Process Flow Diagram; Form 1.2, Summary of Emission Points; and Form 2.0, Emission Point Information.

AIRS ID-Pt and Seg No.: To be completed by the APCP.

SCC Number: List the SCC that identifies the type of process/liquid associated with this emission point.

Annual Throughput of Liquid (1,000 Gallons): This figure is the amount of petroleum liquid loaded into tank trucks, rail tank cars or barges expressed in thousands of gallons per year.

Control Device Type: Describe any air pollution control device(s) used to reduce the amount of the VOCs emitted.

Control Efficiency (%): Enter how effective the control equipment is in reducing the amount of the VOCs released.

Type of Loading: Check the appropriate box to show which type of loading is used at your facility. If Other is selected, please specify the type of loading used.

2) CHEMICAL INFORMATION

Bulk Liquid Type: This is the name of a specific petroleum product that is being transferred from where it is stored into a tank truck, rail tank car or barge. If more than one type of petroleum liquid has been loaded into a tank truck, rail tank car or barge during the year from this emission point, a separate Form 2.0 must be completed to calculate emissions

for each type of liquid.

Molecular Weight of Material Loaded: Enter the molecular weight of the material transferred into a tank truck, rail tank car or barge during the year from this emission point. Table 7.1-2 and Table 7.1-3 from EPA Manual AP-42 provide the molecular weight for some petroleum liquids.

True Vapor Pressure of Bulk Liquid: Enter the true vapor pressure at the storage temperature for the material transferred into tank trucks, rail tank cars or barges. This vapor pressure should be expressed in pounds per square inch atmosphere (psia). Figure 7.1-12A and Figure 7.1-13A from EPA Manual AP-42 illustrate how the true vapor pressure for the petroleum liquid may be obtained.

Saturation Factor: This factor represents the expelled vapor's fraction approach to saturation, and it accounts for the variations observed in emission rates from the different loading methods. Table 5.2-1 from EPA Manual AP-42 lists suggested saturation factors.

Temperature of Liquid: This temperature should be entered as the average temperature of liquid in degrees Rankine. Degrees Rankine is equal to degrees Fahrenheit plus 460 degrees Fahrenheit.

3) LOADING LOSS EMISSION FACTOR

The Loading Loss Emission Factor is the pounds of VOCs that will be emitted per unit of annual throughput of the material transferred for this emission point. The loading loss emission factor for VOCs should be expressed in pounds of VOCs emitted per thousands of gallons of petroleum liquid transferred.

ENTER THE FOLLOWING ON FORM 2.0, EMISSION POINT INFORMATION:

Block 3 - Enter the **Control Efficiency percent;**
Block 4 - Enter the **Annual Throughput** of the petroleum liquid;
Block 7 - Enter the Loading Loss **emission factor** in the VOC Box.

INSTRUCTIONS

FORM 2.5 ORGANIC LIQUID STORAGE, FIXED ROOF TANK WORKSHEET

This form is **REQUIRED** if a facility **wants to calculate its own breathing and working loss emission factors** for fixed roof organic liquid storage tank(s) with a capacity greater than 250 gallons. If using Form 2.5 to calculate the VOC emissions from a storage tank, two separate Forms 2.0 should be completed, one for the breathing loss and one for the working loss from the tank.

The breathing and working loss emissions from more than one fixed tank may be grouped together under a single emission point for tanks that store the same organic chemical. If the fixed roof tanks to be grouped are not identical, a separate Form 2.5 may be needed to calculate the individual tank emissions before grouping the emissions into one emission point.

TANKS, the U.S. Environmental Protection Agency (EPA) computer software package, may also be used to calculate tank emission factors. If this method is used, attach a copy of the printout and list the tank information on a Form 2.5L. The TANKS software may be obtained by downloading the program from the EPA's Technology Transfer Network on the CHIEF Bulletin Board System at (919) 541-5285 or Internet address http://www.epa.gov/ttn/chief/tanks.html or by calling Region VII of the EPA at (913) 551-7020.

All of the information concerning the calculation of a VOC Emission Factor from fixed roof storage tanks was taken from the EPA Manual AP-42, Section 7.1. Reading this Section from AP-42 may provide a more in-depth explanation of the emission calculations for this type of equipment.

NOTE: Tables, Figures and other attachments are not included with these instructions. Please refer to EPA Manual AP-42, Section 7, or contact the Air Pollution Control Program at (573) 751-4817.

Complete the **Facility Name, FIPS County Number, Plant Number and Year of Data.** See Form 1.0 instructions, page 1.0-1.

1) TANK INFORMATION

Point (Tank) Identification No.: This number is the unique identification number for each specific fixed-roof storage tank. This identification notation must match the point number entered on Form 1.1, Process Flow Diagram; Form 1.2, Summary of Emission Points; and Form 2.0, Emission Point Information.

AIRS ID-Pt: This is a three-character emission point identifier assigned by APCP staff. It is used as the Point Number in the EPA's Aerometric Information Retrieval System=s Facility Subsystem database. Once this number is assigned to an emission point, it should remain constant from year to year, even if the Point ID supplied by the facility changes.

Diameter (Ft): Enter the diameter of the storage tank in feet. For horizontal tanks the effective diameter should be calculated using the formula below:

Effective Diameter = [{Tank Length} x {Actual Diameter} / 0.785] ^0.5

Height (ft): Enter the height of the tank for a circular tank in feet. For horizontal tanks leave this block blank.

Length (ft): Enter the length of the tank for horizontal tanks in feet. For circular tanks leave this block blank.

Capacity (in Thousands Gallons): The tank capacity should be expressed in thousands of gallons of liquid. A storage tank with a capacity of 10,000 gallons should be entered as 10 in this box.

Vent Pressure Setting (psig): This value is the breather vent pressure setting and should be expressed in pounds per square inch-gauge (psig). If specific information on the setting is not available, a default value of 0.03 psig may be used. If the fixed-roof tank is of bolted or riveted construction in which the roof or shell plates are not vapor tight, assume the vent pressure setting is equal to the vent vacuum setting even if a breather vent is used. The estimating equation for fixed-roof tanks does not apply if the vent pressure setting exceeds 1.0 (one) psig.

Vent Vacuum Setting (psig): This value is the breather vent vacuum setting and should be expressed in psig. If specific information on the setting is not available, a default value of -0.03 psig may be used. If the fixed-roof tank is of bolted or riveted construction in which the roof or shell plates are not vapor tight, assume the vent vacuum setting is equal to the vent pressure setting even if a breather vent is used. The estimating equation for fixed-roof tanks does not apply if the vent vacuum setting exceeds -1.0 psig.

Color (Roof): Enter the color and shade of the paint on the roof of the tank. Table 7.1-7 provides a list of the most common paint colors.

Color (Shell): Enter the paint color and shade of the shell or side of the tank. Table 7.1-7 provides a list of the most common paint colors.

Paint Condition: Enter the estimate of how well the paint covers the tank surfaces. The paint condition should be expressed as either "Good" or "Poor."

Color (Shell): Enter the paint color and shade of the shell or side of the tank. Table 7.1-7 provides a list of the most common paint colors.

Solar Absorbance: This factor is the amount of solar energy that the liquid stored in the tank absorbs. This factor is related to the color and condition of the paint on the roof and shell of the storage tank. This factor, a dimensionless number, may be obtained from Table 7.1-7.

Type of Roof: Check the box that matches the type of roof for the fixed tank. The equation used to calculate the Roof Height (Ft) (below) should correspond to the box checked for this field.

Roof Height (ft): Enter the distance, in feet, that the roof extends above the tank shell. Leave this field blank for a horizontal tank.

For Cone Roofs, this value can be determined from the following formula:
Cone Roof Height = 0.5 x Tank Cone Roof Slope x Shell Diameter

A default value of 0.0625 ft/ft can be used if specific information on the tank cone roof slope is unknown.
For Dome Roofs, this value may be determined by using the following formula:

Dome Roof Height = Tank Dome Roof Radius
- (Tank Dome Roof Radius^2 - Tank Shell Radius^2)^0.5

NOTE: The value of the Tank Dome Roof Radius usually ranges from 0.8 to 1.2 times the diameter of the tank. If this value is unknown, use the tank diameter in its place. In this case, the Roof Height is equal to 0.268 times the Shell Radius.

Vapor Space Outage (ft): This is the height, expressed in feet, of the average vapor space in the tank, including any volume corrections for the tank roof. One-half of the actual diameter of a horizontal tank should be used as the value for the vapor space outage. A value for the vapor space outage for vertical tanks may be calculated using the formula listed below:

Vapor Space Outage = {Tank Height} - {Liquid Height} + {Roof Outage}

The Roof Outage may be calculated using one of the following formulas:

For Cone Roofs:
Roof Outage = 0.33 x {Tank Roof Height}

NOTE: If the slope of the cone is unknown, use 0.0625 ft/ft as a default value.

For Dome Roofs:
Roof Outage = {Tank Roof Height} x [0.5 + [0.167
x ({Tank Roof Height} / {Tank Shell Radius})^2]]

If the tank diameter is used in place of the tank dome roof radius, the
Roof Outage = 0.0685 x {Shell Diameter}.

Total Solar Insolation Factor (BTU/Sq Ft): This factor is the daily amount of energy that the tank receives due to exposure to the sun. Unless site specific information is available, a value of 1402 BTU/ft^2 per day should be used as a default for this factor.

2) CHEMICAL INFORMATION

Chemical: Enter the name(s) of the chemical(s) stored in the tank during the calendar year.

Vapor Molecular Weight: The molecular weight of the vapor should be for the specific chemical stored in the tank during the year. The value entered should be expressed in pounds per pound-mole. If more than one chemical was stored in the tank at separate times during the year, a separate Form 2.5 should be completed for each material. The vapor molecular weight for selected petroleum and volatile organic liquids may be determined from Tables 7.1-2 and 7.1-3, respectively, or by analyzing vapor samples.

If the tank contains a mixture of different liquids, then the following equation should be used for calculating the vapor molecular weight of the mixture:

$$\text{Vapor Molecular Weight} = M_a(P_aX_a/Pt)+M_b(P_bX_b/Pt)+ \ldots +M_z(P_zX_z/Pt)$$

where the a, b, . . . , z represent different liquids and the M_a, M_b, . . . M_z terms the molecular weights of the respective compounds in the liquid. The X_a, X_b, . . . X_z terms represent the respective mole fraction of each component of the liquid and the P_a, P_b, . . . P_z terms the respective true vapor pressures of each different liquid. Pt is the total vapor pressure found by Raoult's Law, which is shown below:

$$Pt=P_aX_a+P_bX_b+ \ldots +P_zX_z$$

A more detailed discussion on this topic, is provided in AP-42, Section 7.1.

CAS Number: Enter the Chemical Abstract Service (CAS) Registry Number(s) for the chemical(s) stored in the tank during the calendar year.

LST - [Average Liquid Surface Temperature (Rankine)]:

Avg.: This value is the daily average surface temperature of the liquid stored in the tank, expressed in Rankine (R). If this value is unknown, it may be calculated using the formula below:

LST = (0.44 x {D-Avg-AT (Rankine)}) + (0.56 x {LBT (Rankine)})
+ (0.0079 x {Solar Absorptance} x {Total Solar Insolation Factor})

The D-Avg-AT (Daily Average Ambient Temperature) and the LBT (Liquid Bulk Temperature) are defined in the instructions below. The above equation should not be used to estimate the temperature for insulated tanks. For insulated tanks, the average liquid surface temperature should be based on the liquid surface temperature measurements from the tank.

Max: The Daily Maximum Liquid Surface Temperatures may be calculated using the

following formula:
Daily Maximum LST = {LST} + (0.25 x {DVTR})

Min: The Daily Minimum Liquid Surface Temperatures may be calculated using the following formula:
Daily Minimum LST = {LST} - (0.25 x {DVTR})

Temperatures in degrees Fahrenheit may be converted to degrees Rankine using the formula:

Rankine = Fahrenheit + 460

Temperatures in Degrees Celsius may be converted to degrees Rankine using the formula:
Rankine = (1.8 x Celsius) + 492

VP - [Vapor Pressure at LST (Psia)]: Enter the vapor pressure in pounds per square inch absolute (Psia) for the liquid being stored at bulk liquid surface temperature.

NOTE: If the liquid stored in the tank is one of those listed in Table 7.1-2 or 7.1-3, use the true vapor pressure listed there. If the liquid stored is not listed on Table 7.1-2 or 7.1-3, the true vapor pressure can be estimated using Antoines Equation. For more information on how to calculate the true vapor pressures for organic liquids using Antoine's Equation, consult AP-42, Section 7.1.

For Crude Oils

Use Figure 7.1-12a to calculate the true vapor pressure of the crude oil if the Reid vapor pressure is known. First find the stored liquid temperature (in Fahrenheit) on the scale at the right side of the page. The second step is to locate the Reid vapor pressure of the liquid on the scale that is in the middle of the figure. Next, draw a straight line from the stored liquid temperature, through the Reid vapor pressure point, to the true vapor pressure at the left side of the figure. Enter the true vapor pressure reading that is indicated on the scale that is on the left side of the page.

For Refined Petroleum Stocks

The true vapor pressure values for some refined petroleum products can be obtained from Table 7.1-2. Figure 7.1-13A may be used to find the true vapor pressure if the Reid vapor pressure is known. In this case, the first step is to find the stored liquid temperature on the scale at the right of the page. The second step is to locate the approximate position for the Reid vapor pressure, using the slope of the distillation curve on the small graph in the center of the page. The third step is to line up these two points and extend a straight line to the true vapor pressure scale at the left side of the page. Enter this value as the true vapor pressure of the liquid.

Throughput (in Thousands of Gallons): This value is the **annual** amount of the organic

liquid that has been stored in the tank during the calendar year. This value must be expressed in **thousands of gallons** of liquid stored during the year. The value for the throughput should be the sum of the gallons of liquid stored in the tank at the beginning of the year plus the gallons replenished each time the tank was refilled minus any liquid left in the tank at the end of the year.

The following conversion factors should be used if the annual throughput is normally expressed in barrels. There are 42 gallons per barrel for U.S. petroleum products.

Working Loss Product Factor: This factor, a dimensionless number, is 0.75 for crude oils. For all other organic liquids, the product factor default is 1.0.

LBT (Rankine): The liquid bulk temperature should be calculated using the following formula:

LBT (Rankine) = {D-Avg-AT (Rankine)} + (6 x {Solar Absorptance}) - 1

DVTR (Rankine)]: This value for the Daily Vapor Temperature Range may be calculated using the formula:

DVTR = [0.72 x ({D-Max-AT (Rankine)} - {D-Min-AT (Rankine)})]
+ (0.028 x {Solar Absorptance} x {Total Solar Insolation Factor})

or using default values:

DVTR = 15.34 + (39.26 x {Solar Absorptance})

DVPR (psi)]: The value for the Daily Vapor Pressure Range may be calculated using the formula:

DVPR = Vapor Pressure at Daily Maximum LST (psia)
- Vapor Pressure at Daily Minimum LST (psia)

The vapor pressures at the daily maximum and minimum liquid surface temperatures may be found in the same manner as the Vapor Pressure at LST calculations discussed above. Use the respective temperatures in these calculations. A more detailed discussion on how to calculate vapor pressures at various temperatures is provided in AP-42, Section 7.1.

D-Min-AT (Rankine): This value is the Daily Minimum Ambient Temperature expressed in Rankine. The daily minimum ambient temperature information for selected cities may be found in Table 7.1.6 of the AP 42. If site-specific data is not available, a default value of 503.8 Rankine can be used for this value.

D-Max-AT (Rankine): This value is the Daily Maximum Ambient Temperature expressed

in Rankine. The daily maximum ambient temperature Information for selected cities may be found in Table 7.1.6 of the AP 42. If site-specific data is not available, a default value of 525.1 Rankine may be used for this value.

D-Avg-AT (Rankine)]: This value is the daily average ambient temperature based on an annual average expressed in degrees Rankine. This value may be calculated using the formula:

D-Avg-AT = [{D-Max-AT (Rankine)} + {D-Min-AT (Rankine)}] / 2

Using the above defaults for the maximum and minimum ambient temperatures will result in a value of 514.45 Rankine for the daily average ambient temperature.

Number of Turnovers: This value is calculated by dividing the throughput by the tank capacity. Both values must be expressed in thousands of gallons.

Turnover Factor: This factor, a dimensionless number, may be obtained from Figure 7.1-17. If the number of turnovers is greater than 36, this factor may be calculated using the following formula:

Turnover Factor = (180 + {Number of Turnovers})
/ (6 x {Number of Turnovers})

For less than 36 turnovers per year, enter 1.0 (one) as the turnover factor.

3) VOC EMISSION CALCULATIONS

For fixed-roof storage tanks, VOC pollutants are usually emitted by two separate mechanisms. The first, called breathing loss is described as the release of vapors from the tank caused by vapor expansion and contraction. These VOC emissions usually result from changes in temperature and barometric pressure. The second mechanism by which VOC pollutants can be released from a fixed-roof storage tank is called working loss. Working losses are the combined vapor losses that occur as a result of repeatedly filling the storage tank and emptying it with organic liquid during the year.

In each box or on the reverse side of the worksheet, show all the steps in calculating the breathing loss and working loss emission factors.

Breathing Loss Formula: The first equation of Block 3 calculates VOC breathing losses from a fixed-roof storage tank. Breathing loss must be expressed in pounds of VOC emitted annually.

> ***NOTE:*** There is no breathing loss associated with underground storage tanks. Enter zero in this block and make sure the point description indicates that the tank is an underground storage tank.

Working Loss Formula: The second equation of Block 3 calculates VOC working losses from a fixed-roof storage tank. Working loss must be expressed in pounds of VOC emitted annually. The working loss equation presented on Form 2.5 is based on 42 gallons per barrel for petroleum liquids.

Breathing Loss Emission Factor: The breathing loss emission factor is computed by dividing the breathing loss by the capacity (expressed in thousands of gallons). This will give an emission factor expressed in pounds of VOC emitted per thousand gallons of tank capacity.

Working Loss Emission Factor: The working loss emission factor is computed by dividing the working loss by the annual throughput (expressed in thousands of gallons). This will give an emission factor expressed in pounds of VOC emitted per thousand gallons of an organic liquid processed annually.

Enter the SCC for both the **Breathing Loss SCC** and the **Working Loss SCC** next to the corresponding emission factor.

ENTER THE FOLLOWING ON FORM 2.0, EMISSION POINT INFORMATION:

USE A SEPARATE FORM 2.0 FOR EACH EMISSION FACTOR.

Block 4 - Enter the **Annual Throughput** value (expressed in thousands of gallons).
Block 6 - Enter "25" in the VOC Box for Source of Emission Factor to indicate Form 2.5 was used to estimate the VOC emission factors for this tank.
Block 7 - Enter the **Breathing Loss Emission Factor** or the **Working Loss Emission Factor** in the VOC box.

INSTRUCTIONS

FORM 2.5L GENERAL LIQUID STORAGE TANK INFORMATION

This is a **REQUIRED** form only **if SCC Emission Factors are used** to report emissions from either fixed-roof or floating-roof liquid storage tanks with a capacity greater than 250 gallons.

The U.S. Environmental Protection Agency (EPA) has a computer software package (TANKS) that may be used to calculate tank emission factors. If this method is used, attach a copy of the printout and list the tanks on Form 2.5L. Computer software may be obtained from the EPA's Technology Transfer Network on the CHIEF Bulletin Board System at (919)541-5285 or Internet address http://www.epa.gov/ttn/chief/tanks.html or by contacting EPA Region VII at (913) 551-7020. **If the TANKS program is used, you still must transfer the information to the appropriate fields on this form and the Form 2.0.**

If you want to calculate your own **emission factors,** Form 2.5 or 2.6 (whichever is appropriate) **must** be used to report both breathing and working loss emissions.

You will need to complete a Form 2.0 for each type of chemical stored. If the tank capacities are within the same range that would allow you to use the same SCC number, then grouping is acceptable on Form 2.0. However, tanks should be listed individually on Form 2.5L.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**
See Form 1.0 instructions, page 1.0-1.

Point or Tank Identification Number: This number is the unique identification number for each liquid storage tank. This identification number must match the point number entered on Forms 1.1, 1.2, and 2.0. Be sure to include the emission point number if it is different from the tank identification.

AIRS ID-Pt: To be completed by the APCP.

Capacity in Thousands of Gallons: The tank capacity should be expressed in thousands of gallons of liquid. A 10,000 gallon storage tank should be entered as 10 in the box.

Chemical: Enter the name of each liquid stored in the tank during the calendar year. If more than one liquid is stored in a tank during the calendar year, a different section of Form 2.5L must be filled out for each liquid.

Diameter: Enter the diameter of the storage tank in feet.

Height/Length of Tank: The height of the tank should be entered if the tank is circular, and the length of the tank should be entered for non-circular tanks (horizontal tanks). Circle the appropriate heading to indicate whether the value entered is the height or the length of the tank. This value should be expressed in feet.

Throughput: This figure represents the annual amount of liquid stored in the storage tank during the calendar year. It must be expressed in thousands of gallons of liquid. For standing **(breathing)** loss, the throughput will be the same as **tank capacity.** Annual throughput for withdrawal **(working)** loss will be the amount stored in the tank at the beginning of the year plus the sum of the gallons replenished each time the tank was refilled minus any liquid left in the tank at the end of the year.

CAS Number: Enter the Chemical Abstract Service (CAS) Registry number for the chemical stored in the tank during the calendar year.

Enter the SCC for both the **Breathing Loss** (Standing Loss) and the **Working Loss** (Withdrawal Loss) in the appropriate box.

Choose Type of Tank: Put a check mark in the appropriate boxes telling whether it is a fixed or floating-roof storage tank and whether it is a horizontal or vertical tank.

ENTER THE FOLLOWING ON FORM 2.0, EMISSION POINT INFORMATION:

BLOCK 1 - Point or Tank Identification Number;
Point Description, including the type of tank and type of chemical (Example: Fixed Roof Tank-Gasoline);
SCC number and description;

BLOCK 4 - Annual Throughput (Thousands of gallons).

INSTRUCTIONS

FORM 2.6 ORGANIC LIQUID STORAGE, FLOATING-ROOF TANK WORKSHEET

This form is **REQUIRED** if a facility **wants to calculate its own working and breathing loss emission factors** for a floating-roof organic liquid storage tank(s) that has a capacity greater than 250 gallons. A separate Form 2.6 should be used to calculate the emission factors for each individual floating-roof tank (i.e., NO GROUPING OF FLOATING TANKS).

TANKS is a U.S. Environmental Protection Agency (EPA) computer software package that also may be used to calculate tank emission factors. If this software is used, please attach a copy of the printout and list the tank information on Form 2.5L. This computer software may be obtained from the EPA's Technology Transfer Network on the CHIEF Bulletin Board System at (919) 541-5285 or Internet address http://www.epa.gov/ttn/chief/tanks.html or by contacting EPA Region VII at (913) 551-7020.

All of the information concerning the calculation of VOC emission factors for floating-roof storage tanks was taken from the EPA Manual AP-42, Section 7. Reading this section from AP-42 may provide a more in-depth explanation of the emission calculations for this type of equipment.

Emissions can occur from floating-roof storage tanks by four mechanisms: rim seal loss, withdrawal loss, deck fitting loss and deck seam loss. This form only applies to freely vented internal floating-roof tanks or external floating roof tanks. This form does not apply to:

1) closed internal floating-roof tanks;
2) unstable or boiling stocks or from mixtures of hydrocarbons or petrochemicals whose vapor pressure is not readily known or cannot readily be predicted;
3) losses from tanks in which the materials used in the seal system and for the deck construction have become deteriorated or significantly permeated by the stored liquid.

NOTE: Tables, Figures and other attachments are not included with these instructions. Please refer to EPA Manual AP-42, Section 7, or contact the Air Pollution Control Program at (573) 751-4817.

Complete **Facility Name, County Number, Plant Number and Year of Data.**
See Form 1.0 instructions, page 1.0-1.

1) TANK INFORMATION

Point or Tank Identification Number: This is the unique identification number for each specific floating roof storage tank. This identification must match the point number entered on Form 1.1, Process Flow Diagram; Form 1.2, Summary of Emission Points; and Form 2.0, Emission Point Information.

AIRS ID-Pt: See Form 2.0 instructions.

Capacity (in Thousands of Gallons): The tank capacity should be expressed in thousands of gallons of liquid. A 10,000-gallon storage tank should be entered as 10 in this box.

Diameter: Enter the diameter of the storage tank in feet.

Seal Factor, a & b: These factors are based on the emissions from the type of seal(s) on the connection between the floating roof and the storage tank. The values for the seal factors, a & b may be found in the K_{Ra} and K_{Rb} columns of Table 7.1-8.

Clingage Factor: This factor is the tendency of the liquid to remain on the walls of the storage tank after emptying the tank. This factor is related to the shell condition of the tank.

The value for the clingage factor can be found in Table 7.1-10 below.

TABLE 7.1-10 AVERAGE CLINGAGE FACTORS (C) (bbl/1,000 ft^2)

Liquid	Shell Condition [a] Light Rust	Dense Rust	Gunite Lined
Gasoline	0.0015	0.0075	0.15
Single component stocks	0.0015	0.0075	0.15
Crude oil	0.0060	0.030	0.60

[a] If no specific information is available, these values may be assumed to represent the most common or typical condition of tanks currently in use.

Shell Condition: Check the box that most appropriately describes the shell condition of the storage tank. The shell condition is used to determine the clingage factor for the organic liquid stored in the tank.

Type of Construction: Check the box that most appropriately describes the floating-roof tank construction. This will normally be either riveted or welded.

Type of Roof: Check the box that describes the type of roof on the floating-roof storage tank.

Length of Seam: Enter the total length of the deck seam for bolted decks on internal floating-roof tanks only. If the total length of the deck seam is not known, Table 7.1-16 may be used to determine the {Length of Seam}/{Area of Deck} component (Deck Seam Length Factor) of the Deck Seam Loss Calculation. For a deck constructed from continuous metal sheets with a 7-ft spacing between the seams, a value of 0.14 ft/ft^2 may be used for the above Deck Seam Length Factor. A value of 0.33 ft/ft^2 may be used for the Deck Seam Length Factor when a deck is constructed from rectangular panels 5 ft by 7.5 ft. Where tank-specific data concerning width of the deck sheets or size of deck panels is unavailable, a default value for the Deck Seam Length Factor may be assigned. A value of 0.20 ft/ft^2 may be assumed to represent the most common bolted decks currently in use.

Number of Columns: This value represents the number of columns that support the floating roof. Note: The Number of Columns equals zero (0) for self-supporting fixed roofs or external floating-roof tanks. For column-supported fixed roofs, use tank-specific information or a figure obtained from Table 7.1-11 for this storage tank.

Effective Column Diameter: This value is the effective size of the diameter of a column, expressed in feet. The effective column diameter may be found by taking the circumference of the column and dividing by mathematical pi (3.1416). Note: Tank-specific effective column diameter information should be used or a default value of 1.1 for 9-by-7-inch built-up columns may be used for this figure, or a default value of 0.7 may be used for 8-inch diameter pipe columns. A value of 1.0 should be used if the column construction details are not known.

Deck: Check the appropriate box for the type of deck construction. Neither welded deck internal floating roof tanks nor external floating roof tanks have deck seam losses and the

deck seam losses and the deck seam loss emissions should be entered as zero. Internal floating roof tanks with bolted decks may have deck seam losses.

Primary Seal: Check the primary seal type that is most consistent with the primary seal for this specific storage tank.

Secondary Seal: Check the secondary seal type that is most consistent with the secondary seal for this specific storage tank.

Area of Deck: Enter the area of the deck of the storage tank in square feet. See the Length of Seam field explanation if specific information on the Area of the Deck is not available.

Total Deck Fitting Loss Factor: This factor is based on the emissions that can result from various types of fittings and other attachments on the deck.

For External Decks:

The value for the Total Deck Fitting Loss may be calculated using the actual tank-specific data for the number of each fitting type and then multiplying by the fitting loss factor for each fitting according to the following formula:

Total Fitting Loss Factor $= \{(N_{F1}*K_{F1}) + (N_{F2}*K_{F2}) + \cdots + (N_{Fn}*K_{Fn})]$

Where N_{Fi} is the number of roof fittings of a particular type ($i = 0,1,2,3 \ldots, n_f$)
K_{Fi} is the roof fitting loss factor for a particular fitting ($i = 0,1,2,3 \ldots, n_f$) (See discussion below)
n_f is the total number of different types of fittings

The roof fitting loss factor for a particular type of fitting, may be estimated by the following equation:

Roof Fitting Loss Factor for a Fitting $= K_{Fai} + (K_{Fbi} * \{\text{Avg. Wind Speed}\}^{mi})$

Where K_{Fai} is the loss factor for a particular type of fitting in lb-moles/yr;
K_{Fbi} is the loss factor for a particular type of fitting in lb-mole/(mph)^{m}yr
mi is the loss factor

Loss factors for the above equation are provided in Table 7.1-12 for most common roof fittings used on external floating roof tanks. Typical numbers of fittings are presented in Tables 7.1-12, 7.1-13, and 7.1-14. Where tank-specific data for the number and type of deck fittings are unavailable, values for the fitting loss factor may be obtained from Figures 7.1-23 and 7.1-24. The values presented in Figures 7.1-23 and 7.1-24 present the total fitting loss factor plotted against tank diameter for pontoon and double-deck external floating roofs, respectively.

For Internal Decks:

The value for the Total Deck Fitting Loss may be calculated using the actual tank-specific data for the number of each fitting type and then multiplying by the fitting loss factor for each fitting according to the following formula:

Total Fitting Loss Factor $= \{(N_{F1}*K_{F1}) + (N_{F2}*K_{F2}) + \cdots + (Nfn*KFn)]$

Where N_{Fi} is the number of roof fittings of a particular type ($i = 0,1,2,3 \ldots, n_f$)
K_{Fi} is the roof fitting loss factor for a particular fitting ($i = 0,1,2,3 \ldots, n_f$)

n_f is the total number of different types of fittings

Values of the deck fitting loss for a particular fitting type and the typical number of fittings are presented in Table 7.1-12 for internal floating roof decks. Where tank-specific data for the number and kind of deck fittings is unavailable, the loss factor may be approximated according to the tank diameter. Figures 7.1-25 and 7.1-26 present the Total Fitting Loss Factor plotted against tank diameter for column-supported fixed roofs and self-supported fixed roofs, respectively.

Seam Loss Factor: A value of 0.0 should be used for welded decks and external floating roof tanks. A value of 0.14 should be used for bolted decks.

2) CHEMICAL INFORMATION

Chemical: Enter the name(s) of the chemical(s) stored in the tank during the calendar year.

Vapor Molecular Weight: Enter the molecular weight of the vapor for the specific chemical stored in the tank during the year expressed in pounds per pound-mole. If more than one chemical was stored in the tank at separate times during the year, then complete a separate Form 2.6 for each material.

The vapor molecular weight for selected petroleum and volatile organic liquids may be determined from Tables 7.1-2 and 7.1-3, respectively or by analyzing vapor samples. If the tank contains a mixture of different liquids, with each liquid denoted by a, b, . . . z, then the following equation should be used for calculating the vapor molecular weight of the mixture:

$$\text{Vapor Molecular Weight} = M_a(P_aX_a/Pt)+M_b(P_bX_b/Pt)+ \cdots +M_z(P_zX_z/Pt)$$

where M_a, M_b, . . . M_z are the molecular weights of the respective compounds in the liquid. X_a, X_b, . . . X_z represent the respective mole fraction of each component of the liquid. P_a, P_b, . . . P_z represent the respective true vapor pressures of each different liquid. Pt is the total vapor pressure. Raoult's Law, shown below, may be used to find total vapor pressure.

$$Pt=P_aX_a+P_bX_b+ \cdots +P_zX_z$$

AP42, Section 7.1 provides a more detailed discussion on this topic.

Liquid Density: This value should be available from the Material Safety Data Sheets provided by the supplier for the specific material associated with this emission point. If the specific gravity is given on the MSDS (Material Safety Data Sheet), multiply the specific gravity by 8.34 to obtain the density expressed in pounds of material per gallon of liquid. A listing of the average organic liquid densities for selected petrochemicals is provided in Tables 7.1-2 and 7.1-3. If the liquid density for gasoline is not known, an average value of 6.1 lbs/gallon can be assumed.

Annual Throughput: This value is the annual amount of the organic liquid that has been stored in the storage tank during the calendar year. This value must be expressed in thousands of gallons of liquid stored during the year. The following conversion factors should be used if the annual throughput is normally expressed in barrels. There are 42 gallons per barrel for U.S. petroleum products and 31.5 gallons per barrel for other U.S. liquids.

Number of Turnovers: Calculate this entry by dividing the Annual Throughput by the Tank Capacity. Express both values in thousands of gallons.

Product Factor: This factor is a dimensionless number which, for crude oil, is 0.4. For all other organic liquids, the product factor default value is 1.0.

Vapor Pressure at Storage Temperature: Enter the vapor pressure in pounds per square inch (absolute psia) for the liquid being stored at bulk liquid surface temperature.

> ***NOTE:*** If the liquid stored in the tank is listed in Table 7.1-3, use the true vapor pressure listed there. If the liquid stored is not listed on Table 7.1-3, then the true vapor pressure may be estimated using Antoine's Equation. AP42, Section 7.1 has more information on how to calculate the true vapor pressures for organic liquids using Antoine's Equation.

For Crude Oils

Use Figure 7.1-13a or 7.1-13b to calculate the true vapor pressure of the crude oil if the Reid vapor pressure is known. First find the stored liquid temperature (in Fahrenheit) on the scale at the right side of the page. Then locate the Reid vapor pressure of the liquid on the scale that is in the middle of the figure. Next, draw a straight line from the stored liquid temperature, through the Reid vapor pressure point, to the true vapor pressure at the left side of the figure. Enter the true vapor pressure reading that is indicated on the scale that is on the left side of the page.

For Refined Petroleum Stocks

The true vapor pressure values for some refined petroleum products may be obtained from Table 7.1-2. Figure 7.1-14a or 7.1-14b may be used to find the true vapor pressure if the Reid vapor pressure is known. First find the stored liquid temperature on the scale at the right of the page. Second, locate the approximate position for the Reid vapor pressure, using the slope of the distillation curve on the small graph in the center of the page. Finally, line up these two points and extend a straight line to the true vapor pressure scale at the left side of the page. Enter this value as the true vapor pressure of the liquid.

Vapor Pressure Function: This can be calculated using the following equation:

$$P^* = \frac{P_{VA}/P_A}{[1+(1-[P_{VA}/P_A])^{0.5}]^2}$$

where:

P_{VA} = vapor pressure at daily average liquid surface temperature, psia;
P_A = atmospheric pressure, psia.

P* can be read directly from Figure 7.1-19.

3) METEOROLOGICAL CONDITIONS

Average Wind Speed: This value is the average wind speed at the tank site, expressed in miles per hour. The average wind speed numbers should be used for the areas surrounding the specific cities listed in the table below. A default value of 10 miles per hour may be used

for all other locations if other site specific information is not available.

Cities	Average Wind Speed (mph)
Columbia	9.9
Kansas City	10.8
Saint Louis	9.7
Springfield	10.7

Seal Related Wind Speed Exponent: The value for the Seal Related Wind Speed Exponent may be obtained from the (n) column of Table 7.1-8.

Average Temperature: This value is the average temperature at the tank site expressed in degrees Fahrenheit. A default value of 54.5 degrees Fahrenheit may be used if other information is not available.

4) VOC EMISSION CALCULATIONS

Rim Seal Loss: This equation calculates the portion of the VOC emissions that results from losses around the rim seal of a floating roof storage tank, expressed in pounds of VOC lost per year. The Rim Seal Loss emissions from floating roof tanks with a(n) "INTERNAL" roof or "DOMED EXTERNAL" roof are not dependent on the wind speed. Therefore, the {Average Wind Speed}^ {Seal Related Wind Exponent} portion of the equation should be set to 1 (one) when calculating the Rim Seal Loss emissions. Enter the results of the calculation in the box directly below the Rim Seal Loss formula on Form 2.6.

Withdrawal Loss: This equation calculates the portion of the VOC emissions that results from filling and emptying the floating roof storage tank. Express this value in pounds of VOC lost per year.

For "EXTERNAL" Floating Roof Tanks

The **[1 + ({No. of Columns} x {Effective Column Diameter} / {Diameter})]** portion of the equation should be set to 1 (one) when calculating the Withdrawal Loss. Enter the results of the calculation in the box directly below the Withdrawal Loss formula on Form 2.6.
Note: The factor of 23.81 used in this equation converts from thousands of gallons to barrels for the Annual Throughput of petroleum products. If a non-petroleum liquid is being stored in the tank, a value of "31.75" should be substituted for the "23.81" figure.

Deck Fitting Loss: This equation calculates the portion of the VOC emissions that results from the Deck Fitting Losses from fittings and other attachments on the deck of the floating roof storage tank. Express this value in pounds of VOC lost per year. Enter the results of the calculation in the box directly below the Deck Fitting Loss formula on Form 2.6.

Deck Seam Loss: Neither internal floating roof tanks with welded decks nor external floating roof tanks have deck seam losses. Internal floating roof tanks with bolted decks may have deck seam losses. Enter the results of the calculation in the box directly below the Deck Seam Loss formula on Form 2.6.

Working Loss Emission Factor: Compute the Working Loss Emission Factor by dividing the Withdrawal Loss by the Annual Throughput (expressed in thousands of gallons) from

Block 2, Chemical Information. This will give an emission factor in pounds of VOC emitted per thousand gallons of an organic liquid processed annually.

Breathing Loss Emission Factor: Compute the Breathing Loss Emission Factor by adding the Rim Seal Loss, Deck Fitting Loss and Deck Seam Loss together. Divide by the Capacity (expressed in thousands of gallons) from Block 1, Tank Information. This will give an emission factor in pounds of VOC emitted per thousand gallons of an organic liquid stored annually.

Enter the SCC for both **Working Loss** (Withdrawal Loss) and the **Breathing Loss** (Standing Loss) in the appropriate boxes next to the Emission Factors.

ENTER THE FOLLOWING ON FORM 2.0, EMISSION POINT INFORMATION:

NOTE: USE A SEPARATE FORM 2.0 FOR THE WORKING AND BREATHING LOSS EMISSION FACTOR.

Block 4 - Enter **Annual Throughput** (Thousands of gallons).
Block 7 - Enter the **Working Loss Emission Factor** or the **Breathing Loss Emission Factor** in the VOC box.

INSTRUCTIONS
FORM 2.7 HAUL ROAD FUGITIVE EMISSIONS WORKSHEET

This form is **REQUIRED** if a facility must calculate the emission factor(s) from one or more unpaved haul roads located on the facility site. If the Form 2.7 is not used to calculate an emission factor, the company still needs to show how they calculated their Annual VMT.

Use Form 2.7 to derive an emission factor for each haul road activity, according to each industry's SIC (Standard Industrial Classification). If you decide to use Form 2.7 to derive your own emission factors for a haul road, the following instructions apply:

- Use a separate Form 2.7 for each haul road and each vehicle type if capacities of the haul trucks vary.

You may group separate haul roads as one point if certain conditions are met:

a) The physical characteristics of the roads and trucks are so similar that if separate emission factors were calculated, the results would be the same.

b) Truck and road characteristics are so different that calculation of emission factors would yield different results for the different roads. In this case, the reported emission factor is the weighted average of the factors for each road. These emission factors are "weighted" by the VMT.

Example: Suppose a facility has haul roads with VMTs of 1,000, 1,200, and 1,800 miles, respectively. The facility wishes to group and report the haul roads as one point. Further, assume the PM_{10} emission factors have been calculated to be 3.0, 3.2, and 2.1 lbs. PM_{10}/VMT, respectively.

	3.0 lbs. x 1000 VMT =	3,000 lbs.
	3.2 lbs. x 1200 VMT =	3,840 lbs.
	2.1 lbs. x 1800 VMT =	3,780 lbs.
Totals	4000 VMT	10,620 lbs.

10,620 lbs. PM_{10} ÷ 4,000 VMT = 2.655 lbs. PM_{10}/VMT.

Report the appropriate factor on Form 2.0 for the combined haul roads.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**
See Form 1.0 instructions, page 1.0-1.

1) HAUL ROAD INFORMATION

Point Number: This number is the unique identification number for each specific haul road. This identification number must match the point number entered on Form 1.1, Process Flow Diagram, Form 1.2, Summary of Emission Points and Form 2.0, Emission Point Information.

Length of Road: Report the length of the haul road to the nearest tenth of a mile.

Silt Content: Enter the Silt Content of the road surface, if known. Obtain the Silt Content by measuring the proportion of loose, dry surface dust that passes a 200 mesh screen, using ASTM-C-136 method. Table 13.2.2-1 at the end of this instruction set lists some typical Silt Content values. A default value of 8.3 percent may be used for the Silt Content of the road surface if no other information is available.

The PM_{10} emission factor equation of Section [5] requires that the Silt Content be entered as a percent, not the decimal equivalent. Example: If the default value of 8.3% is selected, enter as 8.3 not .083 in the formula.

Surface Material of Road: Enter the type of material that makes up the road surface.

Surface Material Moisture Content of Road: Enter the moisture content of the material that makes up the road. Determining road surface silt and moisture contents are given in AP-42 Appendices C.1 and C.2. It is emphasized that the moisture content to be used in the PM_{10} emission factor of Section [5] **must** reference dry, worst-case conditions. If the default value of 0.2% is selected, enter 0.2 not .002 in the equation.

Days of Rain with at least 0.01 Inches per Year: Enter the number of days of rain if this information is available. The default value of 105 days is the recommended value unless other specific information on the number of days of rain is available.

Type of Dust Control: Check the appropriate box for any control measures that are adequate to reduce the amount of dust released and used every working day when it does not rain. Enter the dust control method and efficiency in the appropriate boxes in Block [3] on Form 2.0, Emission Point Information.

2) HAUL TRUCK INFORMATION

If more than one haul truck is used on the same haul road, attach a page to this form that indicates the following information for each additional haul truck used.

Make/Model of Truck: Enter the Make and Model for this specific haul truck.

Unloaded Truck Weight (in Tons): List the weight of this specific haul truck when empty.

Average Weight of Material Per Load (in Tons): Enter the average weight of the haul truck per load. Calculate this figure by subtracting the Unloaded Truck Weight from the Average Loaded Truck Weight.

Average Loaded Truck Weight (in Tons): Enter the Unloaded Truck Weight plus the average amount of material that this specific haul truck hauls at one time.

Average Truck Speed (in Mph): Enter the Average Speed of the haul truck when it is loaded.

3) MATERIAL HAULED INFORMATION

Type of Material Hauled: Enter the type of material normally hauled. Some examples are gravel, fines, slag, rip rap, etc.

List Any Permit Condition Limiting the Amount Hauled: If a permit issued by an air pollution control agency has a condition limiting the amount of material hauled during the year, then report the permitted amount of material that can be hauled in this box.

Annual Amount Hauled (in Tons): Report the annual amount of material that the specific haul truck associated with this emission point hauled.

Maximum Hourly Amount Hauled: Report the maximum theoretical amount of material that this specific haul truck could haul per hour if operated every day for the entire year.

An alternative method to calculate the Maximum Hourly Amount Hauled is to divide the maximum amount hauled by the total annual hours of operation.

4) CALCULATION OF ANNUAL VEHICLE MILES TRAVELED (VMT)

Annual VMT: This figure for the Annual VMT is a calculated number and is not based on odometer readings for the specific haul truck. The formula to calculate the Annual VMT is:

Annual VMT = 2 x (Length of Haul Road) x (Annual Amount Hauled)
÷ (Average Weight of Material per Load)

Perform the Annual VMT calculation for this haul road and haul truck and enter the results. The Annual VMT units will be miles traveled.

NOTE: If the sum of all the Annual VMT Miles for all haul roads and haul trucks is less than 100 Annual VMT traveled for the entire facility, then the emissions do not need to be reported on a Form 2.0 for purposes of calculating an emissions fee. If the sum of the Annual VMT is less than 100 VMT, additional documentation should be provided to verify the actual amount of the VMT figure.

Maximum Hourly VMT: The formula to calculate the Maximum Hourly Design Rate (MHDR), is [2 x (Length of Haul Road) x (Maximum Hourly Amount Hauled)] / (Average Weight of Material per Load).

5) CALCULATION OF HAUL ROAD EMISSION FACTOR

Block 5 provides an equation from the AP-42 section on Unpaved Roads (Sec. 13.2.2) to calculate the PM_{10} emission factor. The PM_{10} Emission Factor for each haul road and specific haul truck is a calculated number. The figure can be calculated using the formula presented below:

PM10 Emission Factor =
2.6 x ({Silt Content (%)} / 12)^0.8 x [({Unloaded Truck Wt} + {Average Loaded Truck Wt}) / 6]^0.4 x [(365 - {Days of Rain}) / 365] / [{Surface Material Moisture Content (%)} /0.2]^0.3

* If average truck speed is < 15 (mph), multiply the above equation by (average speed / 15)

Calculate the PM10 **Emission Factor** for this specific haul road and enter the results. The units on the emission factor are pounds of PM_{10} emitted per VMT.

Example: Assume average truck speed is 10; unloaded truck weight is 15 tons; average loaded truck weight is 30 tons; use default values of 8.3 for silt content, 105 for days of rain and 0.2 for surface material moisture content.

2.6 x [8.3 ÷ 12]^0.8 x [(15 + 30) / 6]^0.4 x [(365 – 105) / 365] / [0.2 / 0.2]^0.3 x (10 / 15)

2.6 x 0.74 x 2.24 x 0.71 x 1 x 0.67 = 2.05 lbs PM_{10}/VMT

Instructions for Form 2.7
Haul Road Fugitive Emissions Worksheet
Continued

ENTER THE FOLLOWING ON FORM 2.0, EMISSION POINT INFORMATION:

Block 1 - If a more specific SCC cannot be located, use the Stone Quarrying SCC number 3-05-020-11;

Block 4 - Annual **VMT** is the Annual Throughput; units will be VMT, not tons.

Block 7 - Enter the PM_{10} Haul Road Emission Factor.

Block 9 - The applicable efficiency listed under the heading "Type of Dust Control" may be entered in the PM_{10} box. Higher control efficiency for watering of haul roads will be allowed provided appropriate records are kept.

Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIAL ON INDUSTRIAL AND RURAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	No. Of Samples	Silt Content (%)	
				Range	Mean
Copper smelting	Plant road	1	3	16 - 19	17
Iron and steel production	Plant road	19	135	0.2 - 19	6.0
Sand and gravel processing	Plant road	1	3	4.1 - 6.0	4.8
	Material storage area	1	1	-	7.1
Stone quarrying and processing	Plant road	2	10	2.4 - 16	10
	Haul road to/from pit	4	20	5.0-15	8.3
Taconite mining and processing	Service road	1	8	2.4 - 7.1	4.3
	Haul road to/from pit	1	12	3.9 - 9.7	5.8
Western surface coal mining	Haul road to/from pit	3	21	2.8 - 18	8.4
	Plant road	2	2	4.9 - 5.3	5.1
	Scraper route	3	10	7.2 - 25	17
	Haul road (freshly graded)	2	5	18 - 29	24
Construction sites	Scraper routes	7	20	0.56-23	8.5
Lumber sawmills	Log yards	2	2	4.8-12	8.4
Municipal solid waste landfills	Disposal routes	4	20	2.2 - 21	6.4
Publicly accessible roads	Gravel/crushed limestone	9	46	0.1-15	6.4
	Dirt (i.e., local material compacted, bladed, and crowned)	8	24	0.83-68	11

[a]References 1,5-16.

INSTRUCTIONS
FORM 2.8 STORAGE PILE WORKSHEET

This form is **REQUIRED** if a facility is reporting emissions from one or more open storage piles that are on the facility site.

Due to an APCP policy change in March 1998, the methodology for calculating storage pile emissions has been modified. There are now two different categories of emissions from storage piles: **(1) activity and (2) wind erosion**. The activity portion of storage pile emissions submittals includes the vehicle activity and load in/load out components and is calculated in the same manner as in previous EIQs. The wind erosion component is now calculated using pile area **(acres)** instead of **tons** stored as the throughput.

The rationale for the separation of these two categories is the physical difference in the nature of emissions from storage piles. Load in/load out and vehicle activity emissions are generated by human activity around the pile and can be represented by tons stored in the pile. However, wind erosion emissions can occur without disturbance of the pile and only occur during specific meteorological conditions.

With the use of the revised methodology, two different Source Classification Codes (SCC) are required. For quarry and associated industry storage piles, use SCC No. 3-05-020-07, Stone Quarrying, Open Storage (lb/ton) with activity emissions and use SCC No. 3-05-025-07, Sand/Gravel Storage Piles (lb/acre) with wind erosion emissions. **This will require the use of two emission point information forms (Form 2.0) for each different type of storage pile but the point number should be the same.** Assign an activity SCC associated with a pound per ton emission factor to one Form 2.0 and a wind erosion SCC associated with a pound per acre emission factor to the other. For other types of storage piles such as coal, a facility may use an industry-specific SCC if appropriate for activity emissions (lb/ton) and wind erosion emissions (lb/acre).

If you want to continue using SCC No. 3-05-020-07 with the default PM_{10} emission factor of 0.12 lb/ton for all storage pile emissions, complete all the information on Form 2.8 for Block 1, STORAGE PILE INFORMATION and report the information on one Form 2.0. If you are not using SCC emission factors, fill out Form 2.8 completely.

Use Form 2.8 to derive two emission factors for each storage pile, using various criteria inputs. When calculating the PM_{10} emission factor for a storage pile, the following instructions apply.

Use a separate Form 2.8 for each storage pile emission point identified on Form 1.1, Process Flow Diagram and Form 1.2, Summary of Emission Points.

You may group and report separate storage piles as one point if they meet certain conditions: a) the physical characteristics of the pile and the surrounding environment are so similar that, if you calculate separate emission factors, the results would be the same; or b) the physical characteristics of the piles and the characteristics of the surrounding environment are so different that if you calculated emission factors for each pile, the results would not be equal. In this case, the reported emission factor will be the weighted average of the emission factor for each pile.

Activity Emission Factor Example: Suppose a facility has three distinct storage piles with annual throughputs of 100,000, 200,000 and 500,000 tons, respectively. Also assume the respective calculated PM_{10} activity emission factors are .18, .135 and .165 lbs/ton of material stored.

100,000 tons x .18 lbs/ton	= 18,000 lbs.
200,000 tons x .135 lbs/ton	= 27,000 lbs.
500,000 tons x .165 lbs/ton	= 82,500 lbs.
800,000 tons	127,500 lbs.

127,500 lbs. PM_{10} / 800,000 tons = .1594 lbs. PM_{10} /ton.

You would enter this weighted average result of .1594 on Form 2.0 for the activity portion as the emission factor for the point.

Complete Facility Name, County Number, Plant Number and Year of Data.
See Form 1.0 instructions, page 1.0-1.

1) STORAGE PILE INFORMATION

Point Number: This number is the unique identification number for each specific storage pile. This identification number must match the point number entered on Form 1.1, Process Flow Diagram; Form 1.2, Summary of Emission Points; and Form 2.0, Emission Point Information.

NOTE: Again, using the revised approach, there will be two Form 2.0 completed but the same point number will be used for each storage pile or group (one for activity and one for wind erosion).

SCC Number for Activity: List the SCC in tons that identifies the type of storage material for activity emissions.

SCC Number for Wind Erosion: List the SCC in **acres** that identifies the type of storage material for wind erosion emissions.

Type of Material Stored: Enter the type of material in the open storage pile for this emission point. Examples of some common storage pile materials include gravel, fines, pea gravel, crushed stone dust, crushed cinder, etc.

Moisture Content of Stored Material: Enter the moisture content of the storage pile if known. For examples, refer to Table 13.2.4-1 or Table 2.1.2-2 at the end of this instruction set. You may use a default value of 0.7% for the moisture content of the storage pile if no

other information is available.

Use the moisture content percentage, not the decimal equivalent, when calculating the Load In-Load Out Factor in Section 3-A. Example: If the default value of 0.7% is selected, enter as .7 in the formula.

Area of Storage Piles: Estimate the number of acres of land that is under this specific storage pile.

Silt Content: Enter the Silt Content of the storage pile if known. Calculate the Silt Content by measuring the proportion of dry aggregate material that passes a 200 mesh screen, using ASTM-C-136 method. The Silt Content for some common materials stored in open storage piles is listed in Table 13.2.4-1 and Table 2.1.2-2. You may use a default value of 1.6% may be used for the storage pile if no other information is available.

Use the Silt Content percentage, not the decimal equivalent, when calculating the Wind Erosion and Activity Factors in Section 3-B and 3-C.
Example: If the default value of 1.6% is selected, enter as 1.6 in the formula.

Storage Duration: Enter the average number of days per year that aggregate material remains in the storage pile. Table 2.1.2-2 lists some estimates on the storage duration for various types of storage material.

Annual Amount Stored: Enter the total amount of all aggregate material produced and subsequently stored in the storage pile during the year. Enter tons of material stored per year.

Maximum Hourly Amount Stored: List the largest quantity of aggregate that can be loaded into or out of the storage pile in an hour. Enter the maximum number of tons of material stored per hour.

Raw Material Loading Method: Check the box that best corresponds to the main method of loading or removing material from the storage pile.

Raw Material Unloading Method: Check the box that best corresponds to the main method of unloading or adding material to the storage pile.

2) OTHER FACTORS AFFECTING EMISSION RATES

Mean Wind Speed: The statistical mean of all wind speeds at a height 10 centimeters above the storage piles, regardless of the wind direction. You may use a default value of 10 miles per hour for the Mean Wind Speed figure.

Percent of Time the Wind Velocity is Greater than 12 MPH:
The percent of time that the unobstructed wind velocity exceeds 12 miles per hour at the mean pile height. You may use a default value of 32%.

Dry Days Per Year: The number of days that at least 0.01 inches of rain did not fall. You may use a default value of 260 days.

Vehicle Activity Factor: Use the following table to select the correct value for VAF (Vehicle Activity Factor) for this storage pile. You may use a default value of 1.0.

MATERIAL	VAF VALUE
Coal	0.08
Coke	0.25
Gravel	0.25
Iron Ore	0.06
Limestone	0.25
Sand (Fines)	1.00
Slag	1.00
Top Soil (Overburden)	0.25
All Others	1.00

3) STORAGE PILE EMISSION FACTOR CALCULATIONS

A.1 LOAD IN-LOAD OUT FACTOR

The Load In-Load Out factor is a calculated number that represents the amount of PM_{10} emissions that will result from the Load In-Load Out process. Use this formula to calculate the factor:

Load In-Load Out Factor =
0.00224 x ({Mean Wind Speed} / 5)^1.3 / ({Moisture Content (%)} / 2)^1.4 lb/ton
(The Values 1.3 and 1.4 are exponents).

Perform the calculation for the Load In-Load Out Factor and enter the results in Block 3-A.1 of this form.

A.2 VEHICLE ACTIVITY FACTOR

The Activity Factor is a calculated number that represents the amount of PM_{10} released into the atmosphere due to vehicular traffic around the storage pile. Use this formula to calculate the factor:

Activity Factor =
0.05 x ({Silt Content (%)} / 1.5) x ({Dry Days per Year} / 235)
x {Vehicle Activity Factor} lb/ton

Perform the calculation for the Activity Factor and enter the results in Block 3-A.2 of this form

B. WIND EROSION PORTION FACTOR

The Wind Erosion Factor is a calculated number that represents the amount of PM_{10} released into the atmosphere from this storage pile due to wind erosion. Use this formula to calculate the factor:

Wind Erosion Factor =
0.85 x ({Silt Content (%)} / 1.5) x ({Storage Duration (Days)}
x ({Dry Days per Year} / 235) x ({% of Time Wind > 12 MPH} / 15) lb/acre

Perform the calculation for the Wind Erosion Factor and enter the results in Block 3-B of this form.

4) COMBINED ANNUAL STORAGE PILE PM_{10} EMISSION FACTORS

(A) Add the Load In-Load Out Factor (3-A.1), and Vehicle Activity Factor (3-A.2) together and enter the result in Block 4-A of this form. When using this worksheet, always express the units as pounds of PM_{10} emitted per ton of aggregate stored in piles.

(B) Enter the result of the calculation in Block 3-B. When using this worksheet, always express wind erosion units in pounds of PM_{10} per acre of storage.

ENTER THE FOLLOWING ON FORM 2.0, EMISSION POINT INFORMATION FOR THE ACTIVITY PORTION OF STORAGE PILE EMISSIONS:

Block 1 - Enter the SCC. If you use the default SCC, enter **3-05-020-07 (lb/ton).**

Block 7 - Enter the combined Activity PM_{10} Emission Factor (Block 4-A) for this storage pile in the appropriate box.

Instructions for Form 2.8
Storage Pile Worksheet
Continued

ENTER THE FOLLOWING ON A SEPARATE FORM 2.0, EMISSION POINT INFORMATION FOR THE <u>WIND EROSION</u> PORTION OF STORAGE PILE EMISSIONS:

Block 1 - Enter the SCC. If you use the default SCC, enter **3-05-025-07 (lb/acre).**

Block 7 - Enter the Wind Erosion PM_{10} Emission Factor (Block 4-B) for this storage pile in the appropriate box.

Table 13.2.4-1. TYPICAL SILT AND MOISTURE CONTENTS OF MATERIALS AT VARIOUS INDUSTRIES[a]

Industry	No. Of Facilities	Material	Silt Content (%)			Moisture Content (%)		
			No. Of Samples	Range	Mean	No. Of Samples	Range	Mean
Iron and steel production	9	Pellet ore	13	1.3 - 13	4.3	11	0.64 - 4.0	2.2
		Lump ore	9	2.8 - 19	9.5	6	1.6 - 8.0	5.4
		Coal	12	2.0 - 7.7	4.6	11	2.8 - 11	4.8
		Slag	3	3.0 - 7.3	5.3	3	0.25 - 2.0	0.92
		Flue dust	3	2.7 - 23	13	1	—	7
		Coke breeze	2	4.4 - 5.4	4.9	2	6.4 - 9.2	7.8
		Blended ore	1	—	15	1	—	6.6
		Sinter	1	—	0.7	0	—	—
		Limestone	3	0.4 - 2.3	1.0	2	ND	0.2
Stone quarrying and processing	2	Crushed limestone	2	1.3 - 1.9	1.6	2	0.3 - 1.1	0.7
		Various limestone products	8	0.8 - 14	3.9	8	0.46 - 5.0	2.1
Taconite mining and processing	1	Pellets	9	2.2 - 5.4	3.4	7	0.05 - 2.0	0.9
		Tailings	2	ND	11	1	—	0.4
Western surface coal mining	4	Coal	15	3.4 - 16	6.2	7	2.8 - 20	6.9
		Overburden	15	3.8 - 15	7.5	0	—	—
		Exposed ground	3	5.1 - 21	15	3	0.8 - 6.4	3.4
Coal-fired power plant	1	Coal (as received)	60	0.6 - 4.8	2.2	59	2.7 - 7.4	4.5
Municipal solid waste landfills	4	Sand	1	—	2.6	1	—	7.4
		Slag	2	3.0 - 4.7	3.8	2	2.3 - 4.9	3.6
		Cover	5	5.0 - 16	9.0	5	8.9 - 16	12
		Clay/dirt mix	1	—	9.2	1	—	14
		Clay	2	4.5 - 7.4	6.0	2	8.9 - 11	10
		Fly ash	4	78 - 81	80	4	26 - 29	27
		Misc. fill materials	1	—	12	1	—	11

[a] References 1-10. ND = no data.

TABLE 2.1.2-2. REPRESENTATIVE SILT CONTENT, MOISTURE CONTENT AND THE DURATION OF STORAGE PARAMETERS FOR SPECIFIC STORAGE MATERIALS[4,5]

Material in storage	Silt content, weight %	Moisture content, weight %	Duration of storage, days
Coal	4	6	107
Coke	1	1	30
Iron ore	11	1	43
Limestone	2	2	76
Sand	10		
Sinter	1.5	1	90
Slag	2	1	60
Top soil	40		

INSTRUCTIONS
FORM 2.9 STACK TEST
CONTINUOUS EMISSION MONITORING WORKSHEET

This form is **REQUIRED** only if stack tests or continuous emission monitoring results are used to derive emission factors.

Complete this form if you use the results from a stack test or a Continuous Emission Monitor (CEM) to calculate an annual emissions factor for a pollutant emitted from the tested stack. If the testing determined the emission rate for more than one pollutant, you must complete a separate Form 2.9 to calculate the emission factor for each pollutant. The same emission point may emit other pollutants that do not have an emission rate established by the testing. If a stack emits an untested pollutant, determine the amount of the pollutant emitted by another method and enter it on Form 2.0, Emission Point Information, along with the stack test emissions.

The documentation from the testing report provided to verify the emission and production rate should include the minimum number of summary pages necessary to validate the emission and production rate and other testing information reported.

> *NOTE:* Do **NOT** send the entire stack test report or all the results from the continuous emissions monitoring.

Complete **Facility Name, FIPS County Number, Plant Number and Year of Data.**
See Form 1.0 instructions, page 1.0-1.

Point Number: This number is the unique identification number for each specific stack or CEM location. This identification number must match the point number entered on Form 1.1, Process Flow Diagram, Form 1.2, Summary of Emission Points and Form 2.0, Emission Point Information.

Source Classification Code (SCC) Number: List the SCC that identifies the process.

Stack Number: This is the number used to uniquely identify the specific stack. This stack number must match the stack number shown in the flow diagram of Form 1.1.

Pollutant Tested: This is the criterion or toxic pollutant tested.

CAS Number: Enter the Chemical Abstract Service (CAS) Registry number for the chemical tested.

1) EMISSION SOURCE INFORMATION

Equipment Make/Model: Enter the description of the type of equipment that is the source of emission.

Control Device Type: Give a general description of the type of any pollution control devices used for the pollutant tested. The pollutant for which the control device is used must be the same as the pollutant tested in the stack test or monitoring.

Control Efficiency (%): This is the estimated efficiency of the control equipment or a measure of the effectiveness of the control equipment in reducing the amount of the specific pollutant tested and released.

Limitations on Emissions, Production or Operating Time (if any): These are any enforceable conditions that may have been placed on the process by an air permit or other restriction. Typically, air permit conditions may limit the annual amount of the emissions or the amount of a pollutant that may be emitted in a specific time. The permit might also restrict the production rate to a certain maximum level or limit the amount of time that the process may be operated. Any condition that creates an enforceable limitation on the emission point should be entered in this box.

Instructions for Form 2.9
Stack Test Continuous Emission Monitoring Worksheet
Continued

2) STACK TEST INFORMATION

Testing Firm Name and Address: Enter the name and address of the firm that actually performed the stack test.

U.S. Environmental Protection Agency (EPA) Method(s) Used: Enter the number of the EPA Reference Method followed in testing procedures for the specific pollutant in the stack test.

Test Date(s): Enter the date and/or dates of the stack test for the pollutant being tested.

Results: Enter the results of the stack test as they apply to meeting any limitations or to finding the emission rate of the pollutant. You may report this information in an attachment.

Compliance: Compliance means whether the stack test indicated the emissions from the stack were within any permit or other limiting conditions. Checking the Yes box means that the test indicated any limiting conditions were met.

> ***NOTE:*** Do **NOT** send the entire stack test report or all the results from the continuous emissions monitoring.

How Tested: This box identifies the conditions of the stack test. Checking the Operational Rate means that the stack test was conducted when the equipment was running at the normal operating rate. The operational rate test is acceptable for calculating the actual emissions from the stack test. Checking the Maximum Design Rate indicates the stack test was performed while the equipment was running at the maximum rate possible. The Maximum Design Rate test can be used only for calculating the maximum potential emissions for the pollutant. The Both box would indicate that both operating conditions were tested.

Latest Calibration of Testing Equipment: This is the last date that the testing equipment passed a calibration test before it was used to perform this stack test. NOTE: Failure to calibrate test equipment may result in rejection of test data.

Agency Observing Test: This indicates which agency observed the test. Checking the EPA box would indicate that an observer from the Environmental Protection Agency was present during the test. Checking the MO DNR box would indicate that a member of the Missouri Department of Natural Resources was present during the testing. Checking the Other box indicates a member of an agency other than the EPA or MO DNR was present. Please fill in the agency represented.

> ***NOTE:*** If no box is selected the APCP will not accept the test, unless prior approval is given.

Name of Observer(s): This is the full name of the person(s) observing the test. Please include the full name of each agency observer if more than one person or agency was represented.

Instructions for Form 2.9
Stack Test Continuous Emission Monitoring Worksheet
Continued

3) CONTINUOUS EMISSION MONITORING INFORMATION

Concentration of Pollutant: This is the weighted average concentration of the pollutant emitted as indicated by the monitoring results for the entire year. Use the WEIGHTED AVERAGE concentration figure to determine the emissions of the pollutant. Obtain the weighted average for the concentration figure by multiplying the concentration and flow rate figures for each averaging period and summing these numbers. Then divide the figure calculated in step 1 by the sum of the average flow rates for the entire year. This will give the weighted average for the concentration figure for the entire year. Make sure to enter the concentration figure in mass per volume of gas in the Units box.

Flow Rate of Stack: This is the average flow rate indicated by the monitoring results for the entire year. Make sure to enter the flow rate figure in volume of gas per time in the Units box.

Latest Calibration of Monitor: This is the date the monitoring system was last calibrated.

Results of Calibration: Give the results of the latest calibration test. Typically, the results of CEM calibration are expressed with relative accuracy or percent variation from a known test standard.

Monitor Averaging Period: This is the time frame for which the CEM averages the results of the monitoring.

% Monitor Down Time: This is the percentage of time that the CEM system has not been operating or has not been operating properly for the year. A high percentage of Down Time for the CEM may result in rejection of the data for determining the emissions of a pollutant.

4) EMISSION FACTOR CALCULATION

Emission Rate: This is the rate determined from a stack test done under operating conditions or the average rate from continuous monitoring for the entire year. Report the emission rate in pounds of pollutant emitted per hour of operation. The emission rate can be based on input or output rates from the process. The method should be consistent with that used in the production rate, in the testing and the annual throughput figures entered on Form 2.0, Emission Point Information.

Production Rate: This is the amount of material used in or produced by the process during the stack test or monitoring. Express the production rate figure in units per hour of operation. Express the production rate in the same units as the **Annual Throughput** in Block 4 on Form 2.0. The units must correspond to the SCC Emission Factor Units. **Documentation** should include a summary page from the test data that verifies both the emission and the production rates.

Emission Factor: This is found by dividing the emission rate by the production rate. Additionally, if the stack has a control device to control the pollutant of the test or monitoring, the emission factor found above should also be divided by [(100 minus the Control Efficiency Percent) divided by 100]. Enter this calculated emission factor in the Emission Factor box. Also, enter the emission factor units expressed in pounds per unit in the Units box.

Instructions for Form 2.9
Stack Test Continuous Emission Monitoring Worksheet
Continued

ENTER THE FOLLOWING ON FORM 2.0, EMISSION POINT INFORMATION:

Block 3 - If a control device is being used, enter the **Control Device Type** and **Control Efficiency (%)**.

Block 7 - Enter in the appropriate pollutant box, the calculated **Emission Factor** for the pollutant tested at this Stack or CEM emission point.

If the stack is the source of another pollutant that was not tested, some other method must determine the amount of that pollutant and be entered on Form 2.0.